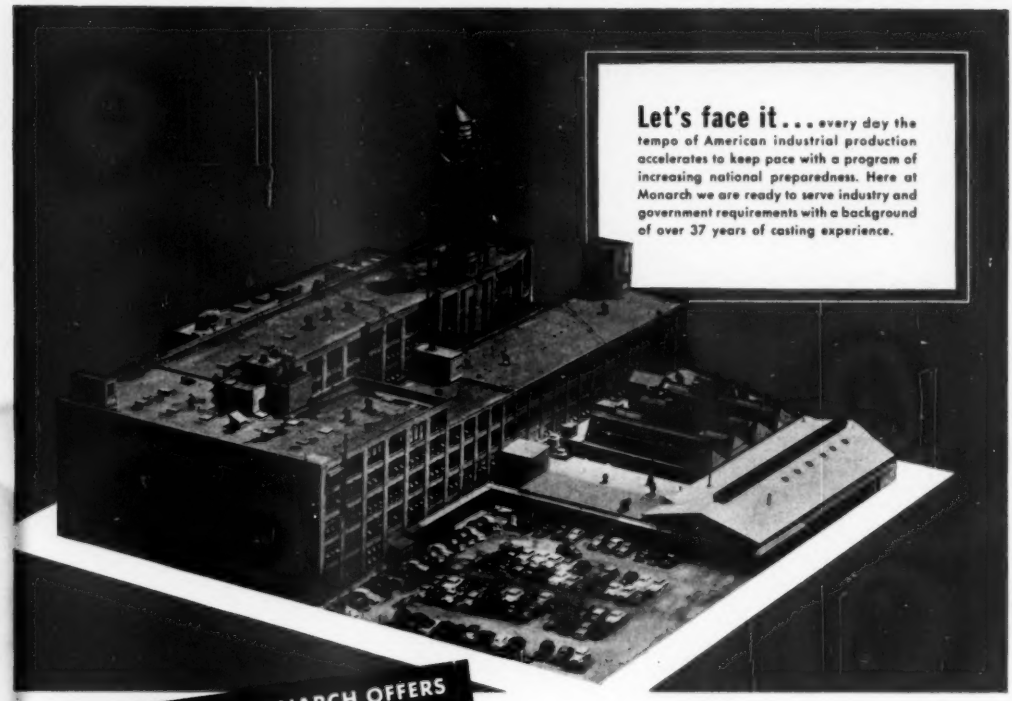
DIE CASTINGS

INCLUDING A SPECIAL FINISHING SECTION

February
1951

THE PRODUCT DESIGN MAGAZINE FOR USERS AND POTENTIAL USERS OF DIE CASTINGS


Let's face it . . . every day the tempo of American industrial production accelerates to keep pace with a program of increasing national preparedness. Here at Monarch we are ready to serve industry and government requirements with a background of over 37 years of casting experience.

HERE'S WHAT MONARCH OFFERS

. . . 300,000 square feet of manufacturing area devoted entirely to the production of ★ Aluminum Permanent Mold Castings ★ Aluminum Die Castings ★ Zinc Die Castings.

. . . Monarch pioneered in the development of aluminum permanent mold castings and today offers the most modern permanent mold production methods.

. . . Monarch also offers a modern die casting division devoted exclusively to precision casting of aluminum and zinc.

. . . Monarch coordinates the production of both permanent mold and die castings under the supervision of two completely staffed engineering departments to assure sound, economical casting design.

. . . Monarch uses complete physical and metallurgical laboratory facilities to maintain highest quality control methods and inspection standards.

. . . Monarch services include finishing and assembly operations for individual permanent mold and die castings or complete product assembly.

. . . Monarch offers modern, company-owned toolroom, maintenance and warehousing facilities within a plant that is strategically located for rail, air or truck shipment.

Here at Monarch we welcome the opportunity to work with you in giving the widest possible casting service, utilizing the full scope of our unique casting facilities.

NOTE: This advertisement forms the nucleus of an interesting folder giving the complete story of Monarch's facilities. We will forward this folder upon request.

MONARCH ALUMINUM MFG. COMPANY • *Detroit Avenue at W. 93rd Street* • *Cleveland 2, Ohio*

THESE HANDSOME NAME PLATES BY "UDICO" LEND AN AIR OF QUALITY TO ANY PRODUCT.

UNION DIE CASTING CO., Ltd.

2313 EAST 51st ST. *INQUIRIES INVITED* **LOS ANGELES 58, CAL.**

FEBRUARY 1951
Vol. 9 No. 2

DIE CASTINGS

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Superior 7-7823 and 7-7824

LOS ANGELES OFFICE—
FRED FRISENFELDT
1250 Wilshire Blvd.—Room 403
Los Angeles 17, California
Tucker 6703

CCA

COVER—PROPER CLEANING is one of the first and most important steps along the finishing line, whether the final effect is to be a plated or painted treatment. The large rack of die cast record player mountings shown on the cover are about to go through their cleaning and chromate dip cycle before being electrostatically sprayed. Details of the processing are explained beginning on page 42.

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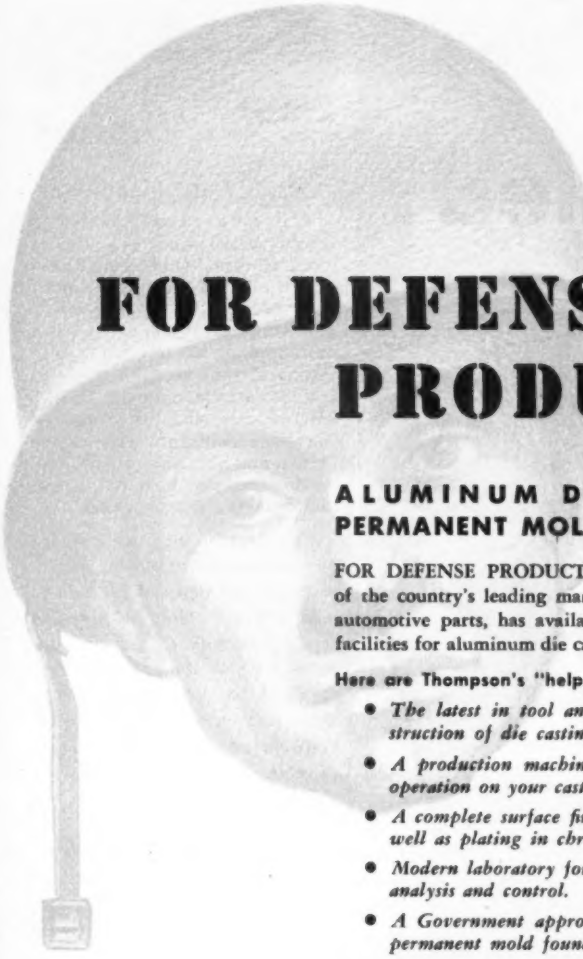


FOR DEFENSE PRODUCTION

ALUMINUM DIE CASTING AND PERMANENT MOLD CASTING FACILITIES

FOR DEFENSE PRODUCTION Thompson Products, Inc., one of the country's leading manufacturers of precision aircraft and automotive parts, has available the most modern and complete facilities for aluminum die castings and permanent mold castings.

Here are Thompson's "helps" for your casting problems:

- *The latest in tool and die shop equipment for the construction of die casting and permanent mold dies.*
- *A production machine shop to handle every machining operation on your castings.*
- *A complete surface finishing department for anodizing as well as plating in chrome, copper and tin.*
- *Modern laboratory for metallurgical, physical or chemical analysis and control.*
- *A Government approved Class 1 completely mechanized permanent mold foundry.*

Thompson Products, Inc., as a manufacturing organization with 15,000 employees, knows and understands your production problems. They have the engineering and production talent to help you. A Thompson sales engineer will welcome the opportunity to work on your defense order casting problems. Direct inquiries to the Light Metals Division.

our 50th Anniversary 1901 1951

Thompson Products, Inc.

2269 ASHLAND ROAD • • • CLEVELAND 3, OHIO

LIGHT METALS DIVISION

Are You Puzzled?

Yes, die castings are different. It takes more than machines to produce die castings.

Die Castings are Newton-New Haven's business. Here is an organization that has production and engineering talent to help you with your die casting problems.

Newton-New Haven has prepared a booklet on "Dimensioning Die Castings." This is basic data that every Engineer and Designer should have. Write on your company letterhead for your copy.

NEWTON NEW HAVEN

THE NEWTON-NEW HAVEN COMPANY

689 THIRD AVENUE • WEST HAVEN 16 • CONNECTICUT

Editor

GOLD PLATED DIE CASTINGS

We are manufacturing a ladies' glove and bag holder made of zinc. Our item is gold plated and we have had a good deal of trouble with plating, polishing and finishing. One of our suppliers has advised us that in one of your recent issues you had an article on gold plating zinc. Please send us a copy of the issue containing the above article and also any other information that you have on plating and finishing zinc.—A.G.S.

The first of our two articles on precious metal plating on die castings was devoted entirely to gold plating. This appeared in our Production Clinic for November 1950. We are pleased to forward this article to A.G.S. along with several other articles and reprints on the general topic of plating zinc die castings.—Ed.

TRADEMARK IDENTIFICATION

Can you identify for me the die casting manufacturer who uses the enclosed trademark on his products? Any information you can give us will be greatly appreciated.—F.H.M.

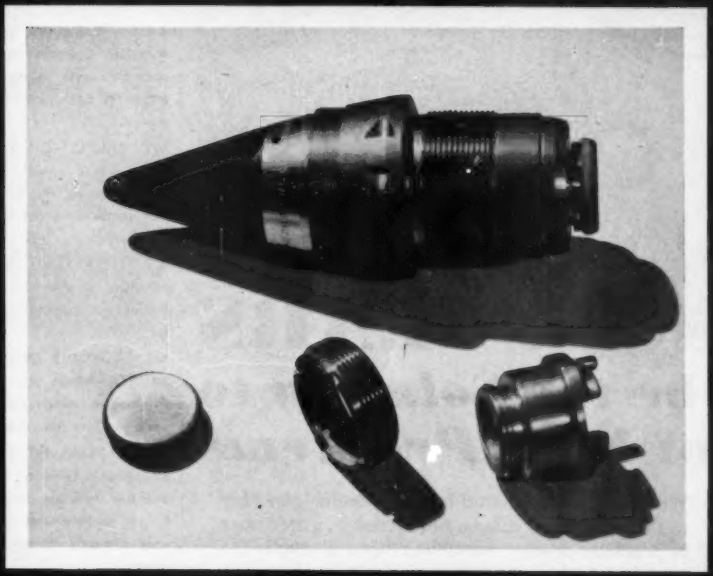
Information forwarded.—Ed.

ZIPPER COVERING

In your January 1951 issue on page 33 is shown a weather protection for guns using a die cast zipper. Can you supply us with the name of a manufacturer who can supply us with a product similar to that shown? We have a very special application in mind and would like to correspond with such a company directly in order to solve our problem.—R. E. T.

Information forwarded.—Ed.

WE DID IT BEFORE...
WE CAN DO IT AGAIN!



Anti-Aircraft Fuses were one of the many items we produced in volume during World War II. Millions of them...at the rate of 48,000 per day.

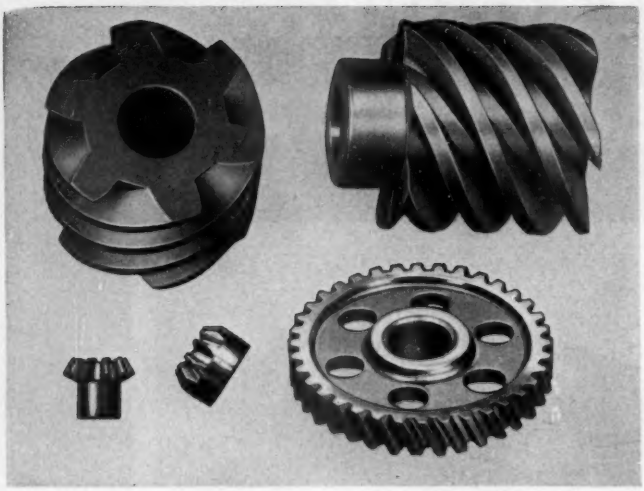
Increased facilities find us even better prepared to meet today's Defense requirements. Send us your inquiries.

PRESSURE CASTINGS, INC.

die castings

ZINC AND ALUMINUM ALLOYS

CLEVELAND 19, OHIO



Die Cast GEARS
may be the *Solution* to one of *Your Problems*

NOTE: We do not stock standard gears, but die cast them to customers' specifications only.

When gears are needed for a particular assembly . . . especially for volume production . . . a number of problems present themselves. Cost is usually the most formidable problem because it involves such factors as machining, finishing, cleaning or other conditioning for assembly. Dimensional tolerances, durability and strength are other factors which may have to be considered.

In recent years, a number of manufacturers have turned to MILWAUKEE for gears to be used in light assemblies. They have found that die-cast gears have the necessary strength, hardness and stability for the purposes intended . . . and that they usually result in collateral advantages of considerable value.

These Advantages Include:

LOW COST — resulting from a substantial saving over gear cutting and other machining operations.

DIMENSIONAL ACCURACY — tolerances may be held within a few thousandths of an inch.

READY FOR ASSEMBLY — die cast gears, as a rule, are ready-for-assembly when delivered.

Worth Investigating

The next time you need small, lightweight gears in quantity, check into the possible benefits of having them die cast by MILWAUKEE . . . to your specifications.

MILWAUKEE DIE CASTING COMPANY
1019 N. FOURTH STREET • MILWAUKEE 3, WISCONSIN

A 5901-2/3

LITERATURE AND SERVICES OFFERED IN THIS MONTH'S ADS

NOTE: Circle numbers on the enclosed postcard to indicate literature, samples or trial services you wish to receive.

A-1. A CATALOG issued by the Electric Auto-Lite Company shows samples of the company's work in die castings and illustrates the methods used to maintain quality control.

A-2. SAMPLES OF TINY DIE CASTINGS and bulletins covering production facilities are offered by the Gries Reproducer Corp. This company specializes in very small zinc die castings.

A-3. LITERATURE AND DESIGN INFORMATION on aluminum and magnesium die castings are available from Litemetal Dicast, Inc.

A-4. A FOLDER DESCRIBING THE MONARCH Aluminum Mfg. Co.'s plant and its zinc and aluminum die casting facilities is available from the company.

A-5. PYDRAUL F-9 HYDRAULIC FLUID is described in Technical Bulletin No. O-D-602 available from the Monsanto Chemical Co. F-9, a nonflammable compound, was developed primarily for use in die casting machines.

A-6. MELTING KETTLES and allied foundry equipment are described and illustrated in C. H. Milles Foundry Co.'s Catalog No. 101.

A-7. HOW TO REDUCE POROSITY with the Ring Valve Co.'s shot control unit is the subject of a company circular. The unit can be installed in the hydraulic line of any die casting machine.

A-8. "DESIGNING FOR DIE CASTING" is the title of a booklet offered by the New Jersey Zinc Co. The booklet shows how castings can be improved and money saved by proper design.

A-9. ENAMEL FILLING of die cast parts with the Acroprinter, manufactured by the Acromark Co., is explained in available literature.

A-10. A BRIGHT CHROMATE FINISH called Iridite can be used to plate zinc of less than .0001 thickness automatically. This is a new finish especially designed for thin zinc plate. Full information and free samples or processing are available.

A-11. "ADVANCED BARREL FINISHING" is the title of booklet D-2, available from Almco Division. The booklet gives details

(Continued on Page 8)

In Production for...

PEACE or DEFENSE

Precision Die Castings Solve Your Production Problems

WHETHER it's parts for automobiles, washers, typewriters, refrigerators, heaters or any of the hundreds of other peacetime products, or — parts for tanks, planes, guns or other implements of defense, Precision has the superior know-how, experience and facilities for solving your production problems with the best die castings you can buy. Precision has a wealth of experience in applying die castings to defense material. This experience is available to you now. What is *your* problem — peacetime or defense production? Whatever your problem, we would like to work with you.

Better DIE CASTING IN ALUMINUM MAGNESIUM AND ZINC

Call a PRECISION Engineer, Today!

*Since 1909 the name "PRECISION" has been the symbol of highest quality in the die casting industry

PRECISION CASTINGS CO., Inc.
212 Walnut St., Fayetteville, N. Y.
Syracuse, N. Y. · Cleveland, O. · Kalamazoo, Mich. · Chicago, Ill.
British Affiliation — Wolverhampton Die Casting Co., Wolverhampton, England

DEPENDABLE
BETTER METHODS
SUPER CAST
DIE CASTINGS
BETTER DIE CASTINGS
SINCE 1919

The meaning of a signature!

Through a quarter of a century of knowing how, the SUPER CAST reputation for Better Methods—Better Die Castings, has been recognized.

Sound engineering, metallurgical knowledge and skilled techniques have achieved and maintained a standard of superior quality.

SUPER CAST has kept faith, always deserving the mark it bears. SUPER CAST means die castings for those who want the best.

A sound, time-tested institution and a sound time-tested product have won confidence and widespread endorsement.

DEPENDABLE
BETTER METHODS
SUPER CAST
DIE CASTINGS
BETTER DIE CASTINGS
SINCE 1919

THE SUPERIOR DIE CASTING COMPANY

1001 London Road CLEVELAND 10, OHIO

Detroit Chicago Pittsburgh
Philadelphia New York

LITERATURE AND SERVICES

(Continued from Page 6)

on the Supersheen method of controlled barrel deburring, grinding and finishing.

A-12. BACKSTAND BELT GRINDING AND POLISHING and its advantages over other methods are discussed in a Coated Abrasives Div., Armour & Co., booklet. The booklet also shows equipment needed for backstand belt work.

A-13. BURNISHING MIXTURES and suggestions on how to use them are contained in a catalog issued by the Abbott Ball Co. The company manufactures burnishing shapes made of bearing ball steel in many shapes and sizes.

A-14. "PROVING GROUND FOR PRODUCTION" is the title of a Behr-Manning Corp. booklet on the advantages of their "Metalite" cloth abrasive belts. The booklet shows how the belts are used in various applications.

A-15. ELECTRICALLY-CONTROLLED AIR MOTORS and other controlled air devices built by the Bellows Co. are shown in Bulletin CL-30. Wiring diagrams, dimensions and other technical data are given in the bulletin.

A-16. INSERTS MADE OF PHOSPHOR BRONZE or stainless steel wire are shown in Heli-Coil Corp. Bulletin No. 650. The bulletin gives design, specification and installation data.

A-17. A DECORATIVE FINISH THAT WILL STICK to chrome plated surfaces is described in Maas & Waldstein Co.'s Bulletin No. 111. The finish is called "Coprene," and is a modified rubber base synthetic.

A-18. CORROSION-RESISTANT AND PAINT-BONDING coatings made by the Neilson Chemical Co. for use on zinc, aluminum and steel are described in five bulletins available from the company.

A-19. A CLEANING-PHOSPHATING MATERIAL that simultaneously removes oil and rust and conditions metal surfaces for painting is described in Oakite Products, Inc.'s Folder F7993.

A-20. AN ELECTRO-CLEANER AND SURFACE CONDITIONER designed especially for use on zinc-base die castings is described in a Diversey Corp. bulletin. Diversey No. 505 is used for reverse-current electrocleaning and surface conditioning.

A-21. DIE-FINISHING COMPOUNDS made by the Hyprez Div., Engis Equipment Co., are described in a company folder. Hyprez diamond compounds are sold in cartridges for use in the Hyprez applicator gun.

A-22. "HOW TO DIMENSION PRINTS FOR DIE CASTINGS" is the title of a booklet offered by the Newton-New Haven Co. The booklet gives detailed instructions for guidance in dimensioning die casting drawings.

TUNE IN "SUSPENSE!"
CBS RADIO NETWORK THURSDAYS
CBS TELEVISION TUESDAYS

AUTO-LITE

DIE CASTINGS

● Increased production facilities for die castings made possible through the famous Auto-Lite "controlled metals" processes are now available. The opening of the great new Lockland plant of Auto-Lite, combined with the enlarged facilities at Woodstock, Illinois, greatly increases Auto-Lite's ability to furnish high quality die castings.

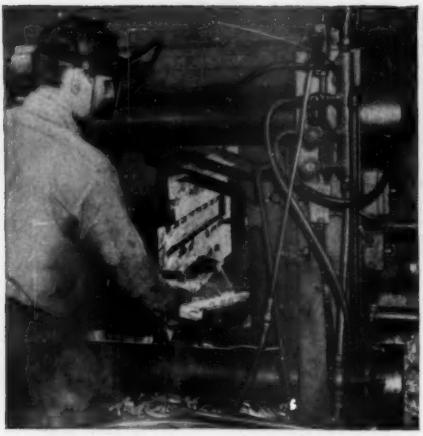
THE ELECTRIC AUTO-LITE COMPANY
Die Casting Division, Woodstock, Illinois

600 S. Michigan Ave.
Chicago 5, Illinois

723 New Center Bldg.
Detroit 2, Michigan

Inquiries invited

Catalog will be sent on request.
Write on your company letterhead.



greater SAFETY for your plant

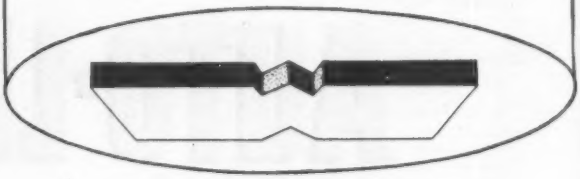
Greater *safety* for employees . . . improved *efficiency* and longer service from machines . . . *economy* in operation. Those are the advantages offered by Monsanto's *new* hydraulic fluid, Pydraul F-9. Pydraul F-9 is known as Hydraulic Fluid F-9 to industries which have tested and are using the product.

Pydraul F-9 is a nonflammable-type fluid developed primarily for use in die-casting machines, hydroelectric turbines, glass-drawing machines, hydraulic presses and other equipment that requires a fluid power-transfer medium.

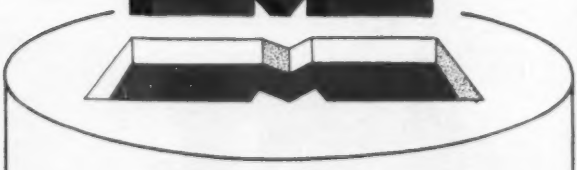
Safety, the major advantage of Pydraul F-9, comes from its nonflammability. This characteristic eliminates the fire hazard of ordinary hydraulic fluids, protecting workmen, machinery and buildings. *Economy* results because Pydraul F-9 has high lubricity and resistance to shear and mechanical breakdown . . . because it does not corrode metals ordinarily used in machines employing hydraulic pressure. *Efficiency* of Pydraul F-9 has been proved in the laboratory and in actual service.

Write for Monsanto Technical Bulletin No. O-D-602 which gives complete details. Address any Monsanto Sales Office or MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri.

Pydraul, Reg. U. S. Pat. Off.



MONSANTO
CHEMICALS—PLASTICS



DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

SERVING INDUSTRY . . . WHICH SERVES MANKIND

For Industrial Wheels and Spools

MADISON-KIPP DIE CASTS LIGHT SECTIONS

Designers find die casting is the superior process for lightness and uniform accuracy in thousands of industrial applications. The wire spools here illustrated require close tolerances on dozens of dimensions. Light sections to reduce weight are also extremely important.

For military and civilian usage you may often find it to your advantage to contact Madison Kipp at the home address in Madison.

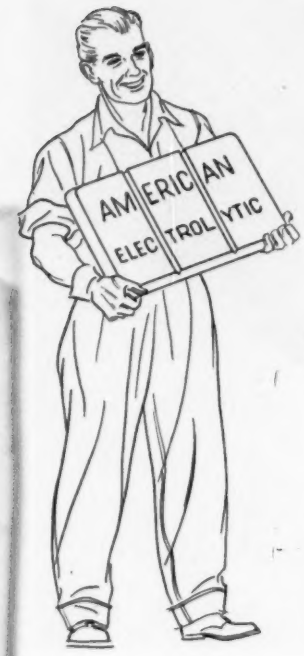
MADISON-KIPP CORPORATION

213 WAUBESA STREET, MADISON 10, WIS., U.S.A.

ANCIENS ATELIERS GASQUY, 31 Rue du Marais, Brussels, Belgium, sole agents for Belgium, Holland, France, and Switzerland.

WM. COULTHARD & CO. Ltd., Carlisle, England, sole agents for England, most European countries, India, Australia, and New Zealand.

- *Skilled in* DIE CASTING *Mechanics*
- *Experienced in* LUBRICATION *Engineering*
- *Originators of Really High Speed* AIR TOOLS



FOR QUALITY PRODUCTION

AMERICAN
ELECTROLYTIC

99.99+%

SLAB
ZINC

A RELIABLE SOURCE FOR DIE CASTING REQUIREMENTS

AMERICAN ZINC SALES CO., Distributors
for AMERICAN ZINC, LEAD & SMELTING CO.
Columbus, Ohio
Chicago
St. Louis
New York

DIE CASTINGS

BY Stewart

41 YEARS OF SERVICE TO INDUSTRY

MOST MODERN DIE CASTING EQUIPMENT

The name of Stewart is continuously identified with the modern advancements in equipment and procedures that have marked the growth of the die casting industry to its present position as a major production process. Stewart die casting machines are veritable power giants, equipped with precision mechanisms, featuring all modern technological refinements and improvements.

Services available to you at Stewart's

- Designing
- Engineering
- Die Making
- Metallurgical Control
- Most modern Die Casting Equipment
- Complete machining, polishing and assembly facilities

We invite inquiries concerning all Die Casting problems.

STEWART DIE CASTING
Division of Stewart-Warner Corporation

4535 Fullerton Avenue, Chicago 39, Illinois
39 Austin Street, Bridgeport, Connecticut

We take pride in being known by the customers we keep

"balance, 99.99+% zinc" *

DESIGNATION & COMPOSITION OF ZINC DIE CASTING ALLOYS:

	REFERENCE DESIGNATION	ALLOY 2	ALLOY 3	ALLOY 5
	NOMINAL COMPOSITION	Copper 2.5-3.5% Alum. 3.5-4.5% Mag. .02-.10%	Alum. 3.5-4.3% Mag. .03-.08%	Copper .75-1.25% Alum. 3.5-4.3% Mag. .03-.08%
ASTM	*American Soc. for Testing Materials*	*B86–XXI*	*B86–XXIII*	*B86–XXV*
SAE	*Society of Automotive Engineers*	*921*	*903*	*925*
NAVY	*U.S. Navy*		*46Z2b– Class A*	*46Z2b&c– Class B*
ARMY	*U.S. Army*		*57-93-2A Alloy A*	*57-93-2A Alloy B*
FED	*Federal Specifications*		*QQZ–363A*	*QQZ–363B*

The phenomenal growth of the die casting industry—the second largest consumer of zinc today—was chiefly provided by the development of "four-nines" metal—which is standard for all zinc alloy die castings.

Prior to 1928, the year Bunker Hill pioneered the production of "four-nines" metal, zinc die castings based on lower grade metal were restricted in their applications due to limitations in physical properties. But as soon as industry was enabled to write "balance 99.99+% zinc" into their specifications, the quality and stability required in die castings were available and the use of zinc alloy castings increased enormously. Die Casting—the shortest distance between raw material and finished product—proved the answer to industry's need for accurate, high-speed and low-cost production of the most complex parts, in a single operation, just as zinc has proved itself as the ideal base metal for die castings. Currently over 70% of all die castings by weight are made of zinc.

DIE CASTING is the Process · ZINC, the Metal · BUNKER HILL, THE PREFERRED ZINC

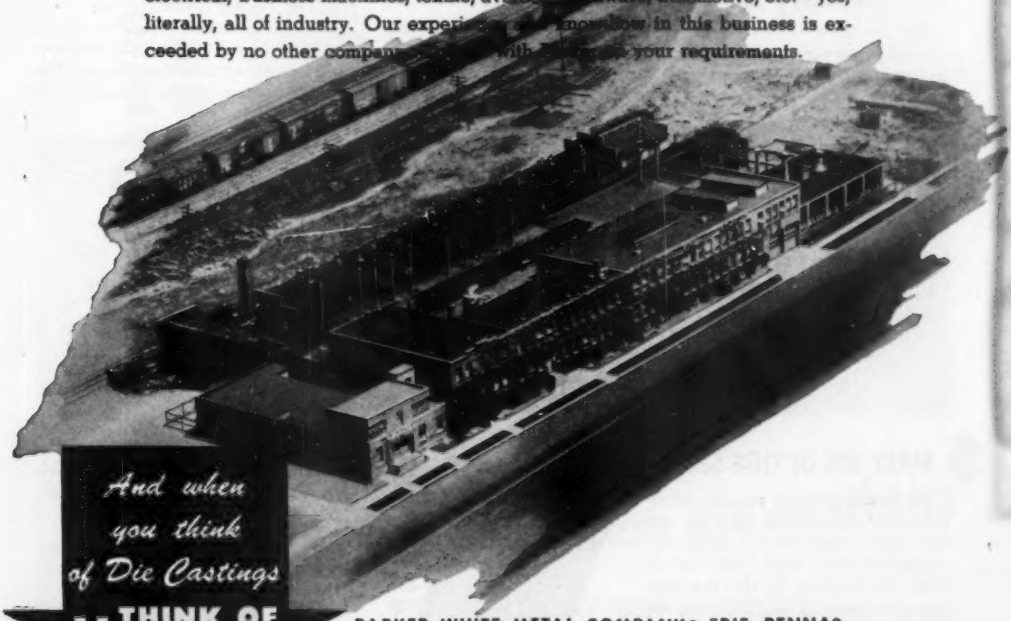
BUNKER HILL 99.99+% ZINC

EASTERN SALES AGENTS ST. JOSEPH LEAD COMPANY 250 PARK AVENUE, NEW YORK 17
SALES OFFICE FOR PACIFIC COAST NORTHWEST LEAD COMPANY SEATTLE, WASHINGTON

PARKER
1901 — 1951

50 YEARS of supplying quality Die Casting to all of industry!

IN 1901 William Allen Parker produced his first Die Castings. These first accurate reproductions were sold at the Buffalo Exposition that year. For the next five years more and more parts were produced and sold. In 1906 the Parker White Metal & Machine Company was formed. Since that time the Die Casting industry and Parker have grown and expanded together. Our effort here at Parker has been to produce better and better Die Castings. For a half century Parker has designed and produced parts [illegible] every industry—electrical, business machines, textile, aviation, hardware, automotive, etc.—yes, literally, all of industry. Our experience and know-how in this business is exceeded by no other company [illegible] your requirements.



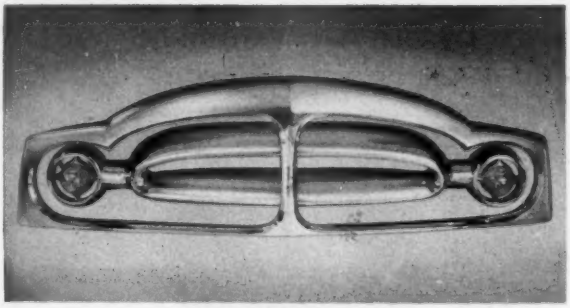
And when you think of Die Castings -- THINK OF

PARKER WHITE METAL COMPANY • ERIE, PENNA •

PARKER ALUMINUM and ZINC *Die Castings*

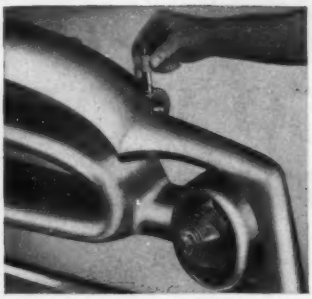
How to get the most for your Zinc Die Casting Dollar $

More ZINC Die Castings were produced in 1950 than in any previous year in the history of the die casting industry. Product engineers, in increasing numbers, have found that properly designed ZINC Die Castings offer a combination of low cost and high quality that is hard to beat. Consider, for example, the expertly designed 1951 Packard radiator grille. Here you will find several hints which may be helpful in getting the most for *your* ZINC Die Casting dollar.



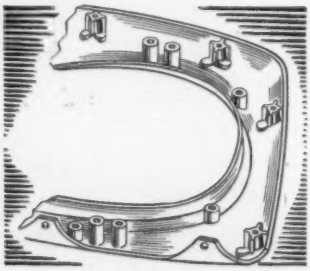
$ MAKE USE OF THIN SECTIONS

While this grille is massive in appearance, clever coring and thin sections have reduced to a minimum the amount of metal used. There are six ZINC Die Castings in this assembly The grille frame is *60 inches long* and is cast in one piece! The convex shape of this casting, and of the two separate inner grille bars, creates a feeling of mass—with section thicknesses as low as .075". The vertical bar at the center of the grille is the fourth ZINC Die Casting in the assembly and the two parking lamp housings bring the total to six.



$ CAST ALL BOSSES

The drawing (below) of one section of the grille frame reveals the bosses accurately cast in position to facilitate attachment of the grille to the car This design feature greatly minimizes assembly costs.



For additional information on the economies possible with ZINC Die Castings ask us—or your die caster—for a copy of "Designing for Die Casting".

Send for your copy

The New Jersey Zinc Company
160 Front St., New York 7, N. Y.

ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

THERE'S A REASON WHY

Cutting Costs on Cutting Tools

A CASE HISTORY:

Stanley Unishears cut steel, but Stanley Electric Tools, New Britain, Conn., cut costs.

Prize example is the new Unishear No. 214-A, made with five Hoover die castings instead of the sand castings used in the preceding model.

Stanley engineers report that—due wholly to the advantages of die castings—

Material costs have dropped 41%

Direct labor costs have dropped 19%

Machining rejects are fewer because the die castings are uniform in size and shape

Styling is better because the die castings provide smooth surfaces and clean detail

Direct and related savings are expected not only to absorb the die costs within five years, but to return at least 20% per year on the investment

Perhaps Hoover die castings—backed by Hoover's 28 years of experience and its complete engineering, design and production service—can reduce the costs or improve the sales appeal of *your* product. It's certainly worth looking into. Just ask a Hoover sales engineer to call on you. There's no obligation.

HOOVER

SPECIALISTS IN THE FIELD OF DIE CASTINGS

THE HOOVER COMPANY

Die Casting Division, North Canton, Ohio

1. A BALL BEARING HOUSING, a simple post and a knurled adjusting knob are all die cast. The bearing housing, *left*, was previously sand cast in iron, the post was turned out from bar stock on an automatic screw machine, but the knurled adjusting knob was designed as a die casting from the start.

SIMPLE FITTINGS

Can be Die Cast for Special Restaurant Equipment

Standard types of small parts—flanges, posts, knobs, retainers and plugs—can be die cast. The savings thus achieved are often impressive, as in this special storage and dispensing equipment.

BIG SAVINGS often come from small parts. This is one reason the Lowerator Division of American Machine & Foundry Company devotes as much care to the design of minor fittings as to the more complex components that go into their automatic devices for storing and dispensing dishes in restaurants and other eating places.

Three small parts used in the Lowerator dispensers are die cast in zinc because they do the job at lower cost. One of these parts has been redesigned from a sand casting, one was formerly machined from bar stock and the third one was designed as a die casting from the start. All three parts are displayed in Figure 1.

Made in two types—a cylindrical unit for plates, saucers and other flatware, and a chassis unit for racks of cups, glasses and similar items—the Lowerators combine sanitary under-counter storage with automatic dispensing at counter level. Refrigerated or heated units are also available for dispensing various foods and beverages.

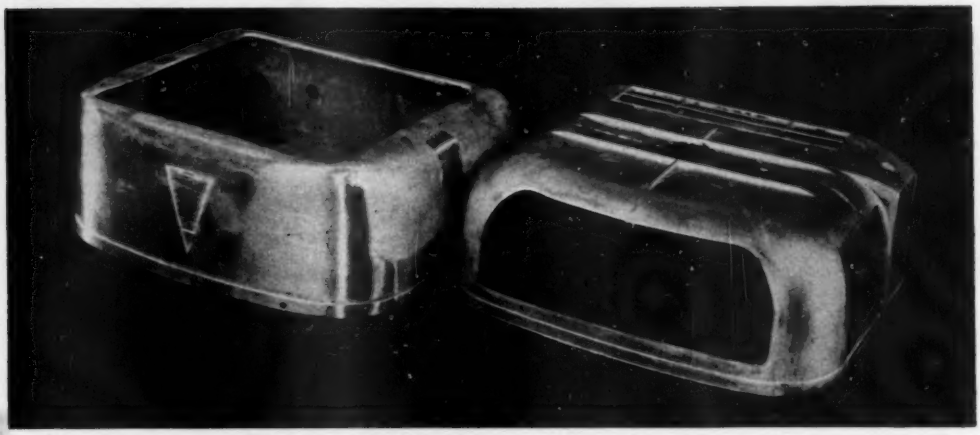
The principle of operation is simple: a calibrated coil spring depresses or expands in direct ratio to the weight of dishes put on it or taken off, automatically feeding the top plate to counter level, no matter how many plates (or racks) are in the dispenser.

The three die cast parts include a flanged bushing for the ends of a shaft, a simple post, and a knurled retainer for a small coil spring. None of these is a complex part posing any special problems for the die caster, and yet each one represent a substantial saving in production dollars.

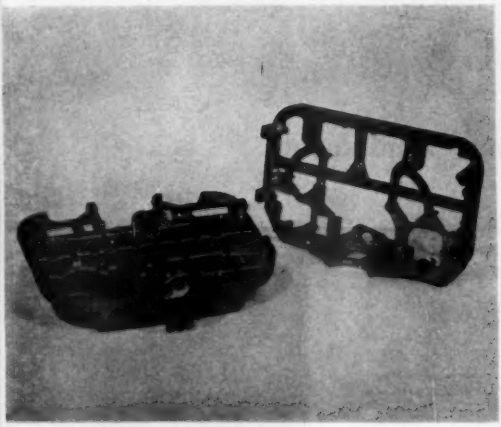
2. COSTLY ENGRAVING of company name and patent numbers on the posts which surround the plate dispenser shown above, has been eliminated now that the posts are die cast complete with all lettering and numerals.

For example, the flanged bushing was, at one time, sand

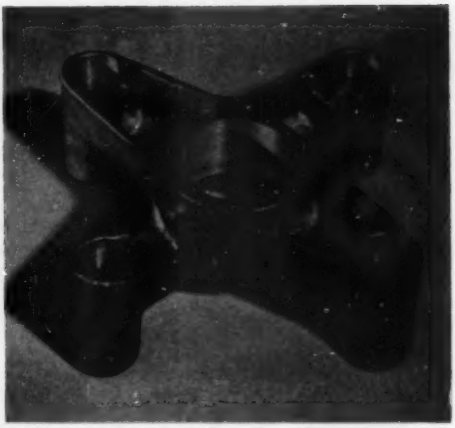
(Continued on Page 58)



WITH ADEQUATE REINFORCEMENT, SECTIONS CAN BE AS THIN AS SHEET METAL.



BY SKELETONIZING MOUNTING FRAMES, A GREAT DEAL OF METAL CAN BE SAVED.



HOLLOW SECTIONS ARE OFTEN STRONGER THAN THICK, SOLID SECTIONS.

THE SAVING of metal, in casting and in machining, that is characteristic of the die casting process, has long been held in high regard by economy-minded product designers. Well known as this attribute is, the current trend in metal supplies emphasizes the need for designs to take maximum advantage of the economies offered.

The design of a die casting is a complex problem involving many considerations, such as appearance, surface quality, proper flow of metal in the die, etc. It is not the purpose of this article to go into all the aspects of die casting design, but rather to reexamine ways in which *waste of metal* can be avoided.

Several good books are available on die casting design. Any one of these will suggest to the designer ways in which he can economize on the use of metal by proper design. It will also become apparent to the designer that in the majority of cases, the best design is the lightest one.

Check Your Design and Save Metal

IS THE SECTION DESIGN AS THIN AS IS CONSISTENT WITH STRENGTH, RIGIDITY AND CASTABILITY OR HAS IT BEEN DETERMINED ARBITRARILY?

Many designers specify thicknesses greater than necessary simply because they neglect to find the minimum feasible section thickness. The section should be thick enough to meet strength requirements, and also to permit proper flow of metal in the die. The wise designer will consult with the die caster before committing himself, in order to find the minimum section thickness consistent with good casting practice.

Some designers specify section thickness as a fraction, when close tolerances are not needed, rather than as a decimal slightly thinner. A great loss may be sustained in this fashion. This can be realized by considering a hemisphere eight inches in diameter. A reduction of .01 in section thickness will save more than 20,000 pounds of zinc alloy in a production run of 100,000 pieces. While this is an exaggerated case, it does show that a reduction of the section thickness can bring a large saving of metal over a period of time.

There are other advantages to a minimum section thickness. Thinner sections cool faster, reducing cycle time. Also, because of the faster cooling rate, the thinner section may have a finer grain structure, resulting in greater strength in proportion to thickness and a tendency toward reduced porosity and improved surface appearance.

CAN PARTS BE REDESIGNED TO ALLOW METAL SAVING CORES OR OTHER WEIGHT REDUCERS?

Many of the products now in use could be modified to require less metal, yet still be of ample strength to perform its function suitably. Examination of present designs shows that in many cases the casting has far greater strength than is required.

In other cases, a sacrifice of appearance may be justified, by making the casting strictly functional, at the expense of its decorative properties.

A mounting frame or base which is now produced as an enclosed boxlike shape may be just as sturdy if metal savers are used to remove as much as 50 per cent of the cast area.

Changes may be effected by inserting stop-off or other metal saving cores in the die. These cores can be so placed as to remove metal where such metal does not affect the strength of the structure. In this case, consultation with the die caster is advisable, so that metal flow will not be impeded, or the casting process made unduly difficult.

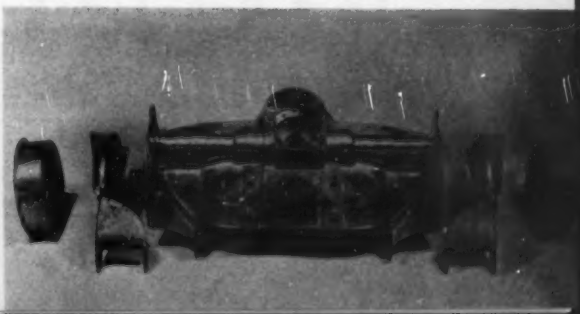
The extra tool cost may be justified today on the basis of metal savings, even though it would not normally be worth while.

ARE CORES USED TO HOLLOW OUT HEAVY CONCENTRATIONS OF METAL, WHERE POSSIBLE?

In designing a die casting, no opportunity should be overlooked to save metal by using cores. Cores can be used to eliminate metal inside large bosses, ridges and other raised shapes on the casting.

Such cavities not only reduce the amount of metal needed, but tend to reduce porosity, stress concentrations and cold shuts by keeping section thickness constant. If necessary for reasons of strength or rigidity, the core can be made in such a way as to leave stiffening ribs across the cavity.

The decision to use coring or drilling to produce holes in die castings is usually made on the basis of the size of the hole and the accuracy with which it must be located. It may be in some cases that the difficulty connected with the maintenance of small diameter cores, or some loss in accuracy of



EVEN A VERY LARGE PIECE CAN BE CAST THIN IF THE LOAD CARRYING PORTIONS ARE CAREFULLY DESIGNED.

location, will be thought worthwhile, if a sufficient saving of metal can be realized.

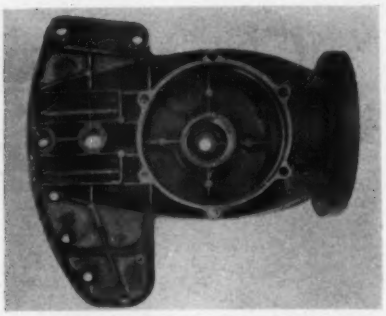
IS MORE METAL BEING LOST IN CHIPS THAN IS NECESSARY?

Much of the machining done on die castings consists of reaming and tapping cored holes, and this is largely unavoidable. Machining out slots, grooves and other recesses, however, can sometimes be avoided by the use of more complex coring.

There is little prospect of metal economy in specifying closer tolerances, since the tolerance limits are already well established on the basis of good die casting practice; further, finishing cuts are rarely so deep on die castings that much metal is wasted. Designers should be well aware, though, of the tolerances available to them, so that unnecessary machining is avoided.

HOW DOES FINAL SURFACE TREATMENT AFFECT SECTION DESIGN?

Fine finishes, such as glossy enamel or plating, generally require a somewhat thicker section, to insure against flow marks that would mar the finish. If it is possible to use a finish, such as a wrinkle finish, on the casting, it may be possible to reduce section thickness.



UNIFORM WALLS WITH CROSS-RIBS SAVE METAL, PROVIDE RIGIDITY.

WORTH MONEY $ $ $ $ $ $ $ $

$ FOR RUSTPROOF HARDWARE, die cast zinc has a great deal to offer. A typical application of die castings in a spring-actuated sash balance illustrates some of these advantages in an article beginning on page 30.

$ BUILDERS OF MACHINERY and machine accessories will be interested in the details of yarn tension compensators being manufactured for the textile machine industry. Description of these units begins on page 32.

$ CLEANING ALUMINUM is the subject of a comprehensive article by D. F. Seymour starting this month in the Production Clinic on page 37.

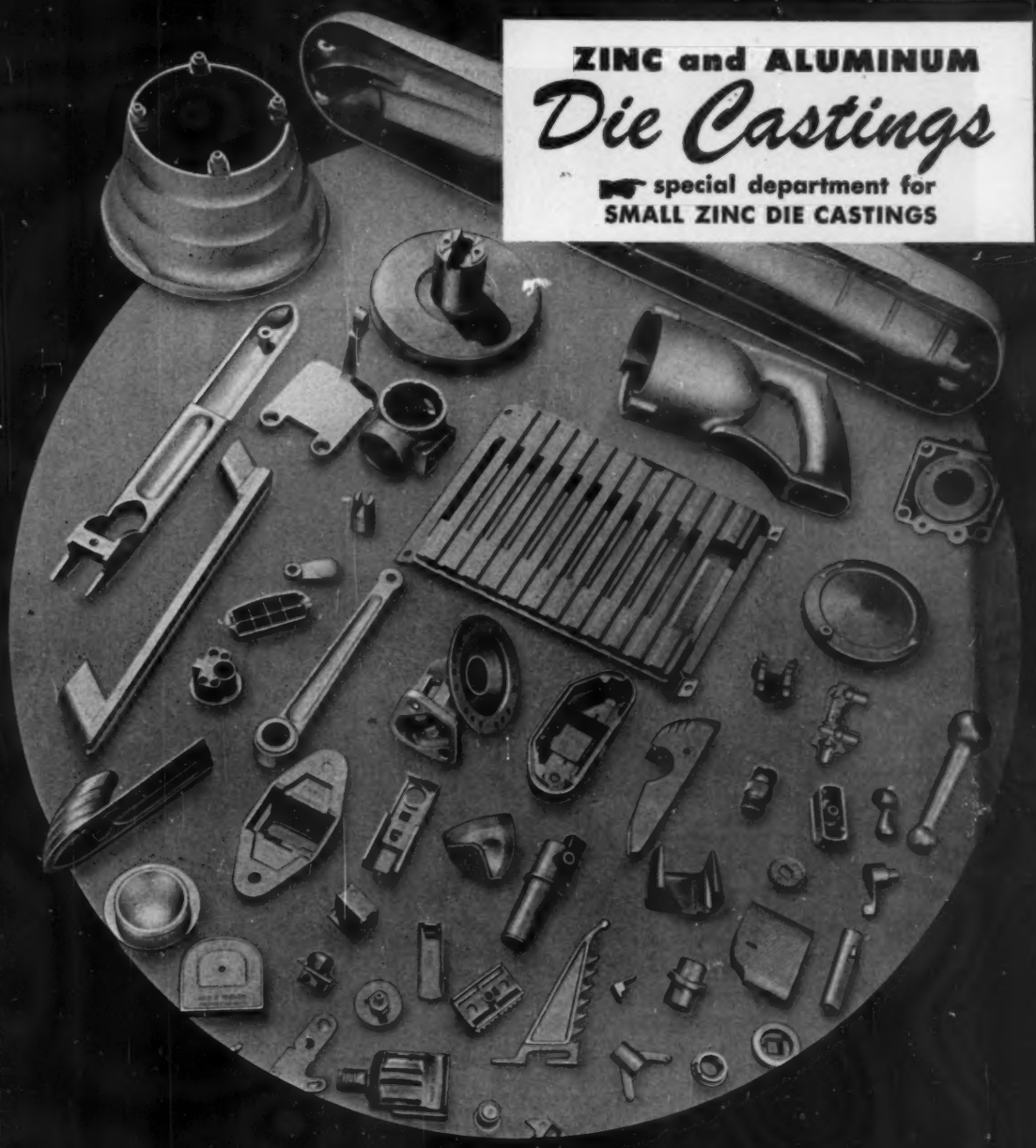
$ SOME NEW PRODUCTION AIDS. Beginning on page 45 are presented many useful products, tools and services for lightening your job. They include: a thorough discussion of the use of broaching machines for finishing die cast surfaces . . . a new lubricant for abrasive belts to prevent loading . . . a complete metal finishing service . . . a fluid-abrasive finishing machine . . . and many others.

$ ELECTROSTATIC PAINT SPRAY methods, as used by a manufacturer of record changers, are described in an article starting on page 42.

ZINC and ALUMINUM

Die Castings

special department for
SMALL ZINC DIE CASTINGS



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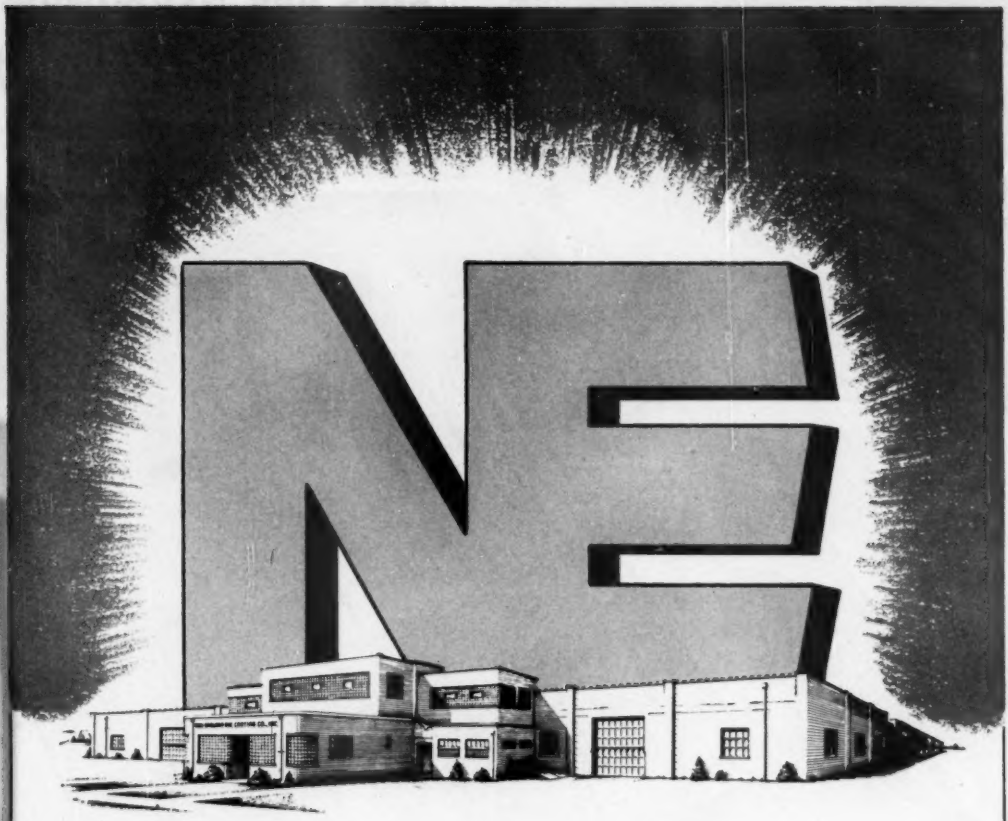

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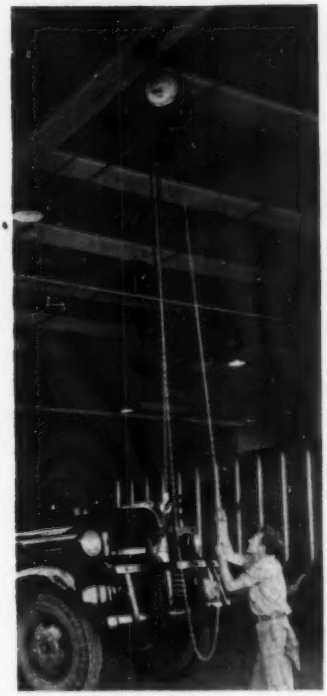
President

THE NEW ENGLAND DIE CASTING CO.
445 FRONT AVENUE · WEST HAVEN, CONNECTICUT

It is not necessary to construct weight-lifting devices of heavy materials. Aluminum die castings are being used in these chain hoists because they possess the desirable combination of high strength and light weight.

HUSKY BUT NOT HEFTY



BY REDUCING WEIGHT fifty per cent, the utility of these hoists has been greatly increased. Compactness, portability and resistance to knocks and abuse have been engineered into the half-ton and one-ton chain hoists.

THE COMBINATION of light weight and high strength which is characteristic of aluminum alloy die castings is nowhere more important than in the new line of chain hoists manufactured by The Yale & Towne Manufacturing Company.

Three aluminum alloy die castings go into each half-ton and one-ton chain hoist—for the hand wheel, chain guide and gear cover. None of these parts is directly stressed, but all components of this heavy-duty industrial equipment are subject to considerable impact and abuse.

A fifty per cent reduction in weight has been accomplished by replacing ferrous alloys with aluminum wherever possible in these hoists. The three large die cast parts represent an important part of the saving in weight.

At the same time as weight has been slashed (from 62 to 36 pounds for the half-ton hoist and from 94 to 41 pounds for the one-ton unit) efficiency has been stepped up to a reported 95 per cent, permitting a full load to be raised three feet in 20 seconds.

The alloy selected for die casting these three components is ASTM B85-46T (SC7) which has an exceptionally high strength to weight ratio. Its tensile strength is 45,000 psi and yield strength 26,000 psi.

A one-piece handwheel die casting comes from the die complete with 11 accurately formed pockets around its circumference for a ¼-inch hand chain. The die parting lies around the OD of this complicated piece, so that the identations for chain pockets must be formed by several slides in the die.

As received from the die caster, this part needs only one machining operation, the cutting of an Acme thread with 1" lead inside the cored hole in the central boss. Cast dimensions are not too critical for this equip-

ment, but strength and stability are required.

The two other die cast parts, both serving as covers to shield and enclose the mechanism of the hoist, can be assembled without secondary operations.

Of particular interest is the economical application of a plug in the die for the handchain guide and cover to make an interchangeable numeral "½" or "1", since this component is used for both the half-ton and one-ton models. Easier tool amortization results from spreading costs over two models instead of having separate cavities for each unit.

The two cover die castings have product and company identification clearly indicated by large, clear, highly legible lettering formed by the die. This is an inexpensive, permanent and attractive method for applying the company name, trade mark and other information.

UNIVERSAL
Die Castings
Preferred WHEN ONLY
THE BEST IS GOOD ENOUGH
There must be a reason why so many highly discriminating manufacturers entrust all of their work to us. The reason is they know from experience that the finished job will meet every specification as to appearance, strength, accuracy and function. Furthermore, the price on either long or short runs is in line with their production and selling costs.
If you are located west of the Mississippi River we are in an excellent position to take care of your die casting requirements. Quotations made promptly.
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Spray Aluminum

A simple finishing cycle is used on these parts. Exterior pieces, such as the handchain guide, are sprayed with a coating of aluminum paint from Gilbert Spruance Company, and the lettering and decorative bars which are cast in high relief are given a rolled coating of black ink to make them stand out.

The changeover to aluminum die castings for these hoists has brought with it many production advantages — reduction in machining, uniformity and interchangeability of parts, smoother surfaces and improved appearance, along with the most important feature — reduction in weight and increase in efficiency.

Portability, and therefore, utility of these hoists, is greatly enhanced by the new compactness and lightness. Aluminum die cast parts, along with other aluminum castings, have permitted the design of a thoroughly effective piece of materials handling equipment.

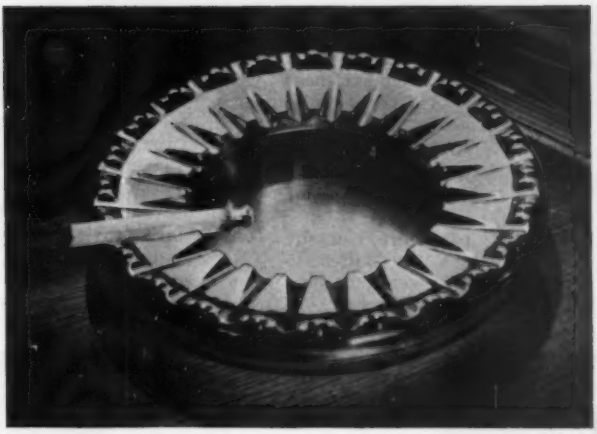
RESEARCH METALLURGIST ADDRESSES BRASS FOUNDERS

Donald L. LaVelle, research metallurgist of the Federated Metals Division, American Smelting and Refining Co., New York, N. Y., recently delivered an address before the Metropolitan Brass Founders Association at the Hotel Holley, New York City. His speech, entitled "Aluminum Casting Defects and Their Correction" dealt with various aluminum casting flaws and the means available to correct them.

APPOINTED DISTRICT MANAGER

Kenneth D. Davis has been appointed district manager in charge of the Chicago office of the Elastic Stop Nut Corporation of America, Union, N. J.

Mr. Davis joined ESNA in 1946 as a sales engineer, and was transferred in 1948 to Union, N. J., to become manager of the ES-nail Division.



The striking two-tone finish on this ash tray is achieved by sand blasting part of the tray prior to chrome plating. The ash tray consists of two zinc die castings, assembled with a snap fit.

Low Investment Costs . . . High Quality Products

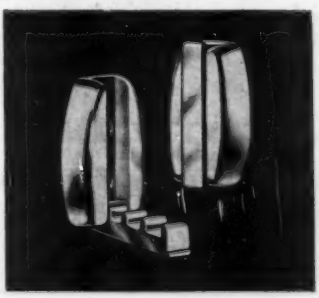
An idea, a design, enough capital to purchase dies—these three items can be enough to start a business. Utilizing commercial die casting and finishing facilities, R-Kay Products has added these two items to its line without incurring tool expense other than the dies.

DESIGNED to be decorative as well as utilitarian, the Hideaway Secret Hook, marketed by R-Kay, of Cincinnati, Ohio, is intended for use where the convenience of a coat hook is wanted without its unsightliness. The Hideaway is sold in pairs, and is fastened to walls, doors and the interiors of automobiles with one screw.

The Hideaway Secret Hook is made up of two aluminum die castings, one of which forms the wall bracket, the other being a swinging bar that acts as a hook. Four sets of hooks are cast in a gate containing eight cavities. The strength of these castings is evidenced by the fact that the assembly will hold more than 30 pounds.

The finishing operation consists of buffing the aluminum die castings to brightness. The parts are then assembled by fitting two bosses on the swivel into recessed slots in the bracket. The swivel is held in place by a flat spring which in turn is fastened to the bracket by a flared brass bushing. The spring also serves to snap the swivel into its recessed position when the hook is not in use.

This concealed wall bracket for garment hangers is assembled from two buffed aluminum die castings. Costs on this item could be reduced still further by the development of automatic buffing equipment to replace manual work.



The bosses and slots which, together, provide the hinging action, are formed integrally without any machining.

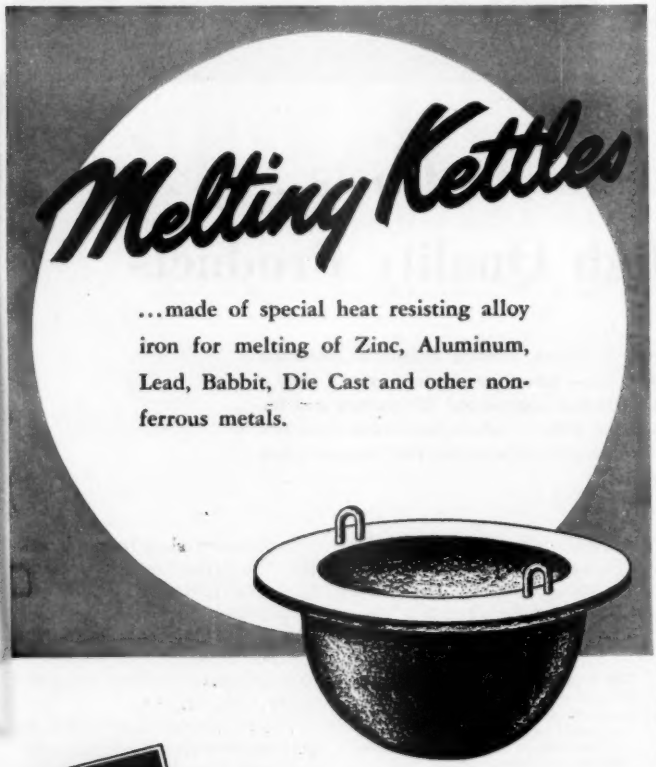
A small, low cost item of this type would be economically impossible by any other production method, inasmuch as the die casting process provides attractive forms, great strength, integral means of assembly, smooth surfaces and high production rates.

The Coronet ash tray, also an R-Kay product, was designed to be "everything an ash tray

should be." The recessed design keeps ashes from blowing even when exposed to a direct draft from a fan, and a non-skid base keeps it from sliding on a smooth surface at angles up to 55 degrees. Ridges and projecting buttons prevent cigarettes from falling or blowing out of the tray.

The two parts are zinc die castings, which are buffed to brightness and given a chrome plate with undercoating of copper and nickel. The inner part of the snuffing ring is sand-blasted before plating, giving a pleasing contrast to the mirror finish on the rest of the tray. In sales literature, the company says that the tray can be scoured with soap and brush without damage to the finish.

The use of zinc die castings for the ash tray adds weight (1¼ pounds) for stability, and also makes possible sharp breaks in the snuffing ring which would be difficult, if not impossible, to stamp. The most unusual feature of the product, however, is the finish, which gives it the luxurious and costly appearance desirable for living room use.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...made of special heat resisting alloy iron for melting of Zinc, Aluminum, Lead, Babbit, Die Cast and other non-ferrous metals.

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Enameled Pouring Ladles • Salem Pressed Steel Ladles • Melting Kettles and Skimmers

CYANAMID BUILDS IN CHICAGO

American Cyanamid Co., New York City, has announced that a 100,000 square foot building is under construction in Chicago, which will be leased to the chemical firm. The building will contain 80,000 square feet of warehouse space on the first floor, and 20,000 square feet of office space on the second floor.

KROMER NAMED CHIEF CHEMIST

Newly appointed chief chemist of the Trade Sales Division of Standard Varnish Works, New York, is Arthur E. Kromer.

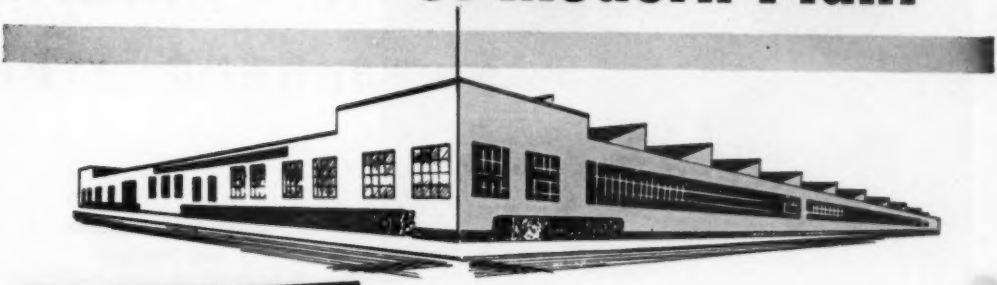
A graduate of The University of Florida and active in the color-chemistry of finishes for more than twenty-three years, Mr. Kromer has held positions with several of the outstanding manufacturers of Trade Sales paints, varnishes, and enamels.

ASTE MEETING GEARED TO DEFENSE

IN VIEW of international developments, technical sessions planned for the 19th annual meeting of the ASTE in New York, March 15th to 17th, inclusive, will attempt to cover most of the recent advances in many phases of production. Prime objective is to disseminate as much new production know-how as possible to the men in industry responsible for applying this know-how in defense production—the tool engineers.

On the tentative agenda are five papers covering new developments in pressworking of metals, eight related to machining, six on inspection and quality control, eight on tooling. The general subjects of processing and planning, production management, gear production, special production processes, and so on are also covered. In all 33 "production know-how" papers are scheduled thus far.

Over 80,000 Square Feet of Modern Plant



PARAGON DIE CASTINGS are all the name implies—excellent in structure—outstanding in appearance—unsurpassed in design.

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DIE CASTINGS

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PARAGON DIE CASTING COMPANY

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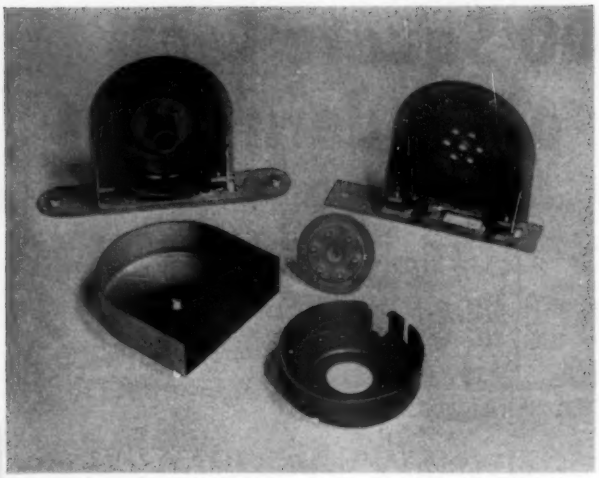
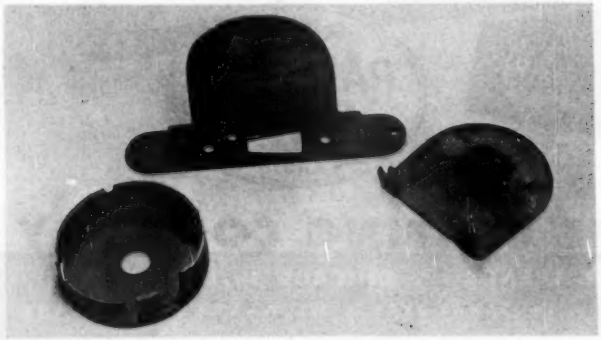
Bearing For

By ALLEN C. BOUCHER
Vice President
Caldwell Manufacturing Company



POSITIVE RADIAL LOCATION of the die cast spring axle is accomplished by means of the six rivet bosses on the underside of the casting which mate with holes punched in the steel housing. Two views of the die cast axle, *below*, show the internal tongue for anchoring the coil spring, and the shoulder on the underside which serves as a noiseless bearing surface.

EASILY BROKEN and expensive to manufacture, the old type cast iron sash balance unit was housed in the components shown *below*.



WHEN PRESSED STEEL housings replaced cast iron ones for spring sash balances produced by the Caldwell Manufacturing Company about 10 years ago, a key factor in the modernized design was the incorporation of a die cast zinc spring axle.

These sash balances employ a coiled clock spring in place of the counterweights used in conventional window sashes. Caldwell balances are also used to counterbalance other objects such as photographic enlargers, X-ray machines and Kleig lights.

The earlier cast iron housing was bulky, heavy and subject to breakage due to the brittleness of the metal. Pressed steel gives us a lighter, more compact design which has eliminated breakage altogether. Furthermore, the die cast axle for the spring has added several important advantages derived both from its design and from the inherent characteristics of the zinc alloy.

Among these advantages is freedom from rust, with consequent noiseless window operation—a must in a mechanism that is used in opening and closing windows in such buildings as hospitals, hotels, and schools. Building hardware may be seen but not heard.

Two recent and striking installations of this company's products are in the Shamrock Hotel in Texas and in the 5,000

Properties of Zinc Quiet Window Operation

window UN Secretariat Building in New York City.

True, an axle could be fabricated from mild steel, but ferrous metal is subject to rust and, moreover, the bearing quality of steel on steel is not nearly so good as that of zinc on steel. In short, the zinc axle helped make possible the modern, compact design with smooth operation.

Design Objectives

The design change had to meet several assembly requirements which merit consideration one by one:

Requirement — One objective was to attach the 1⅞" long axle to the center of the housing wall, or frame, with the simplest possible assembly operation. *Solution*—A secure attachment, plus the desired simplicity, was achieved by die casting the axle flange with six bosses to serve as rivets on its underside.

Requirement—One end of the flat clock spring steel had to be attached to the axle post to give a permanent locking effect. *Solution* — A tongue with tapered edge to hold the bent annealed end of the spring without danger of slippage is formed within the hollow axle post. Ability to core an irregularly-shaped hole makes possible this anchor for the spring without extra cost.

Requirement — The axle post had to be assembled to the frame so that the tongue would be in a predetermined position. *Solution* —The rivets formed as bosses on the flange are keyed radially in relation to the holes in the pressed steel frame so that the tongue is invariably in the proper position for machine-winding the spring.

Design Facilitates Assembly

Assembly is started by putting the die cast axle in inverted position in a fixture, which places the rivets "up." The rotating pressed steel drum is then added. The drum rides against a shoulder formed on the flange.

After addition of a fiber washer (with lubricant), the frame subassembly is placed on top, the rivets on the axle passing through the holes in its wall. The rivets are then peened over —a task made easy because the zinc alloy is very ductile and can be cold worked without cracking or breaking.

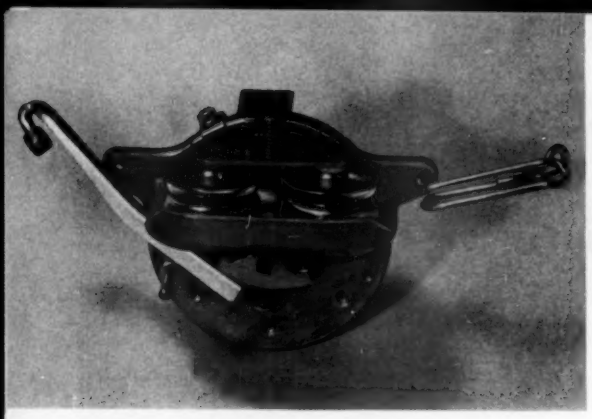
The frame assembly is now ready for receiving the clock spring steel. This is machine-wound on the axle post after its bent, annealed end has been anchored to the tongue inside the post. The other end of the spring engages a slot in the outer rim of the rotating drum.

(Continued on Page 56)

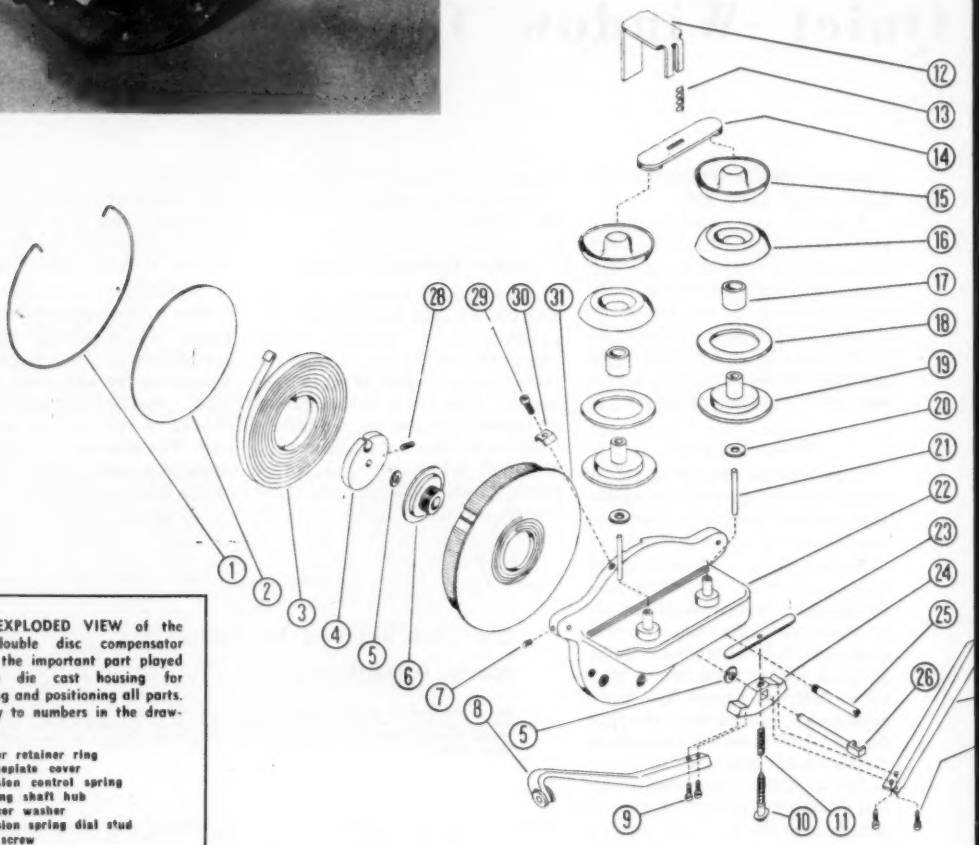
Die Cast Building Hardware Has Many Advantages:

Among the types of building hardware which are now being die cast are: casement window operators, venetian blind hardware, door knobs and door checks, window frames, electrical fittings and similar parts. Some of the reasons for this trend are listed below.

CORROSION RESISTANT	Even in coastal areas where salt atmospheres and humidity are severe, die cast zinc and aluminum are able to resist corrosion.
QUIET BEARINGS	Where metal parts rotate or slide against each other, the good bearing properties of die cast zinc are welcome. This eliminates squeaking, rusting steel friction surfaces.
EASY TO FABRICATE	By providing bosses, rivets, holes, ears and other assembling conformations, without additional operations, die castings have proved to be an effective way to assemble hardware components.
DURABLE FINISHES	Although often left unfinished, die castings can also be given a wide variety of attractive, plated, painted and chemical finishes which enhance their appearance and increase their resistance to corrosion.
LOW COST	Building hardware is produced in large quantities, which is the way in which die castings are at their most economical.

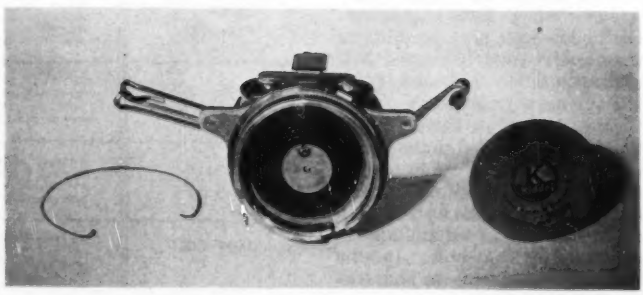


1. HIGH HUMIDITY is sometimes present where textiles are being processed, and it has therefore been necessary to construct these tension compensators from a corrosion resistant aluminum alloy. In this double disc compensator, yarn enters through the formed wire arm at *right*, moves between the two pairs of polished steel discs, and is guided off by the high twist control arm, *left*.



2. EXPLODED VIEW of the double disc compensator reveals the important part played by the die cast housing for mounting and positioning all parts. The key to numbers in the drawing is:

1. Cover retainer ring
2. Nameplate cover
3. Tension control spring
4. Spring shaft hub
5. Spacer washer
6. Tension spring dial stud
7. Set screw
8. High twist control arm assembly
9. Control screw
10. Adjustment screw
11. Detent spring
12. Pressure lever indicator
13. Compression spring
14. Pressure bar
15. Top disc
16. Bottom disc
17. Disc sleeve
18. Disc felt
19. Disc support
20. Thrust washer
21. Disc plunger
22. Bracket body
23. Compensating bar
24. Compensating block
25. Stop stud
26. Spring shaft
27. Control arm assembly
28. Set screw
29. Knurled cap screw
30. Lock clip
31. Tension spring dial



ON EACH OF THESE textile machines is a Kidde tension compensator which automatically adjusts the tension on the yarn to compensate for variations in weight, thickness or coefficient of friction.

BECAUSE OF HIGH HUMIDITY ALUMINUM IS PREFERRED IN THESE DIE CASTINGS.

FOR USE WITH TEXTILE MACHINES

THE QUALITY of textiles, particularly synthetics, is markedly affected by the tension of the yarn during processing. One of the major problems with which the textile industry has to contend has been the maintenance of a constant predetermined tension despite differences in the weight, thickness and coefficient of friction among yarns, and the varying speeds at which yarns must be handled.

(27)
(9)

No single instrument could be developed that would be capable of solving every tensioning problem, but Walter Kidde & Company, Inc., has developed a series of tension controls, each of which has some limitations, but which collectively represent the widest application of tension controls available.

By means of adjustable tension springs and friction discs mounted upon die cast brackets, three models of tension compensators have been developed for specific applications. These units are fully automatic, being actuated by variables in the yarn as they reach the device, thus making an immediate adjustment to maintain constant tension regardless of changes in thickness, weight or friction of the material.

When these devices were designed, it was found that the only practical way in which the various parts of the tensioning mechanism could be mounted or anchored in close relative position was to die cast the framework.

This has been done, utilizing the characteristic advantage of the die casting process to form irregular shapes which otherwise would be expensive to machine or assemble, and to hold dimensions and center distances within prescribed limits.

Because of the high humidity which frequently accompanies the processing of yarn or textiles, and the presence of finishing chemicals, an aluminum alloy has been selected for these die cast compensator bodies. This alloy contains 3.0-4.0 percent copper and 4.5-9.5 percent silicon, and is designated AMS 4291.

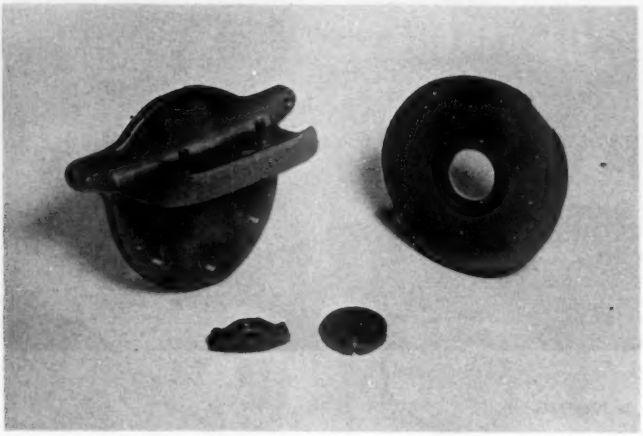
Compact and Self-Contained

The double disc compensator shown in two views in Figures 1 and 3 is a good example of a compact, self-contained unit in which many features have been combined into a minimum number of parts. The exploded view, Figure 2, illustrates the position of die cast parts in the assembly, while Figure 4 provides a close-up view of the castings themselves.

Briefly, the function of this unit is as follows: yarn enters via the formed wire input guide shown at the right in Figure 1 and moves between two pairs of highly polished chrome plated steel friction discs. The yarn is then fed through the eye of the control arm assembly.

The discs are spring loaded in such a way that the tension can be set by turning the knurled

3. ALL PARTS of the double disc compensator are mounted on the main die cast part, shown at *left* with the front cover removed to reveal the way in which the coil spring is anchored between the die cast housing and the die cast hub.



4. CRITICAL CENTER DISTANCE between centers of studs on the bracket body, *left*, is held by die casting within ±.005. Spiral groove in the surface of the tension control dial, *right*, is formed by the die. The die cast compensating block and spring shaft hub are shown in the foreground.

die cast spring-tension control dial. Numbers formed around the flange of the control dial indicate the setting. Two models of the double disc compensator are available, one for tensions between 10 and 140 grams, and a heavy duty model for tensions between 100 and 300 grams.

The interplay of two springs shown in the exploded view, controls the tension on the discs.

A number of critical dimensions are held in the die cast bracket body. Of these, perhaps the most important are the two vertical studs on the flange, used for mounting the friction discs. Drilled holes must be centered in these small-diameter studs, which means that the studs themselves must be accurately located. Diameter of the studs is held in casting to +.000 —.002 and center distances between the studs is ±.005, while tolerance between the center of the studs and lower face of the flange (across the die parting) is held to +.004.

Most holes in this piece are cored, although there are a few drilling and tapping operations. The flange that guides the yarn is highly polished, also. Other than these simple operations, the die casting needs no other preparation before being assembled.

Spiral Groove Cast

The inner face of the tension control dial has a spiral groove cored into its face, Figure 4. The indicator pressure lever which can be seen in Figure 3, has a small tab at its lower end which rides in this cored spiral groove, so that when the dial is turned, the lever is raised or lowered to decrease or increase pressure on the friction discs.

To machine such a double spiral groove would be a relatively slow machining operation, but is obtained here as an integral part of the die cast surface. The double spiral serves as a stop at the end of two turns of the dial, and prevents the spring from being overstressed or turned backward.

One end of the tension spring, Figure 3, is anchored in the die cast dial, and the inner end of the spring is anchored in another, smaller die cast part, the spring shaft hub, which is a simple, flat, uniform-sectioned piece.

Only other die casting in this assembly is the irregularly-shaped compensating block to which the control arm assembly is mounted. This has a square hole which is cored and broached to receive the spring shaft and, in addition, requires the drilling and tapping of five small holes.

Another model of tension compensator is shown in Figure 6. This is the warp compensator used to prevent uneven tensions at the warp beam. This unit

(Continued on Page 57)

5. MATING CAMS are produced easily by die casting. The small cam shown in the foreground conforms to the cammed surface formed integrally with the underside of the body casting.

FINISHING DIE CASTINGS

A SECTION DEVOTED TO THE FINISHING PROCESSES

MACHINING—Most die castings require some machining operations. In this section will be found information to aid in planning and selecting the proper method and equipment for these operations.

ASSEMBLING—Die castings are generally assembled components. This section includes information on fastenings and methods for mass production assembly operations.

SURFACE FINISHING—Most die castings receive some type of surface finish such as plating, organic coating, anodic coating or chemical coating. This section contains information on the methods, processes and equipment used for the various surface finishing treatments on the die casting alloys.

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PRODUCTION CLINIC
for finishing die castings

A monthly digest of current technical progress selected and prepared by the editorial staff of DIE CASTINGS. This section is devoted to finishing processes for all types of die castings, and is written specifically for the benefit of the production man.

ALUMINUM CLEANING (PART ONE)

By D. F. SEYMOUR
The Diversey Corporation

AT ONE or more stages in its transformation from raw metal to some usable product, aluminum, like all commercially fabricated metals, must be cleaned. Oils and greases will result in non-adherent painted and electroplated finishes. They will also cause non-uniform color in dyed anodic coatings. Oxides promote poor spot welds and increase spot welding costs. The necessity for cleaning aluminum is as great as for cleaning steel, brass, or zinc base diecastings.

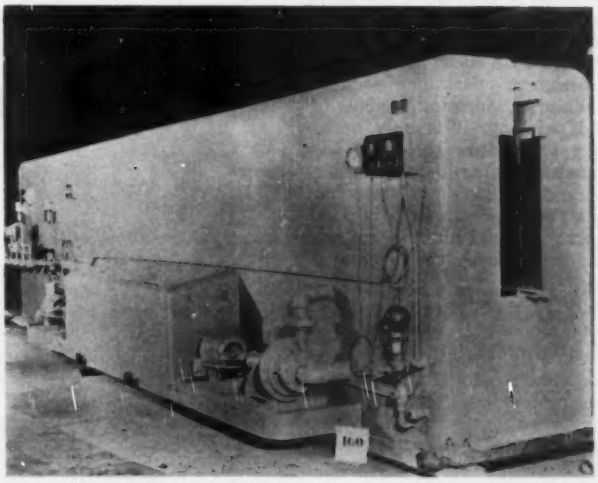
The soils which must be removed from aluminum surfaces may be classified in several ways. For this discussion we will group them as to general sources. The first type includes those which are intentionally applied to the surface for the purpose of developing necessary surface characteristics and those accidentally coming into contact with and adhering to the surface due to atmospheric dirt or improper handling.

To reduce the coefficient of friction between the forming tools and the aluminum, various waxes, oils, and greases are applied as drawing, polishing, buffing, machining, spinning and stamping compounds. The various compounds may contain one or more waxes, oils and/or greases, plus solid particles such as abrasives in polishing compounds. Hot oils of various compositions are used to artificially age certain aluminum alloys. Identification inks which are applied to identify the alloy and its previous treatment are one of the most difficultly removable contaminants in the first group. These inks vary considerable in composition and ease of removal. Among the solid contaminants are tripoli, lime, white silica, emery, etc. Burnishing soaps may also be present.

Among the accidental contaminants of group 1 are the oily and solid particle materials present in the atmosphere, the various liquids and solids spattered on aluminum parts which are poorly stored or mishandled at one time or another, and water marks.

The second type of soils are smuts whose sources lie in the composition of the various aluminum alloys. Examples include the manganese smuts of alloy

RACKED DIE CASTINGS can be processed on the production line using this type of monorail conveyor cleaning machine. Photograph courtesy of Cincinnati Cleaning and Finishing Machinery Company.



THE AUTHOR of this review of aluminum cleaning methods, D. F. Seymour, is a graduate of the University of Minnesota. He worked in plating research with the Promat Division of Poor and Company before joining Diversey Corporation. He is now plant manager and supervisor of manufacturing at the South Gate, Cal., plant of Diversey Corp.

3S, the silicon smuts characteristic of aluminum alloy die castings, the copper smuts of alloy 17S, and others. As are all smuts, these are difficult to remove. Their particle fineness makes them extremely adherent.

The third type of soils are the oxides of aluminum. They prevent the adherence of electrodeposits in much the same way that oxides of iron and copper base alloys prevent adherence.

From the standpoint of contamination, our cleaning problem is very comparable with that for steel, brass, copper and other metals. The degree of cleanliness required is also quite comparable with these metals. For subsequent operations such as machining, forming, anodizing and painting, it is only necessary to remove the first two classes of contaminants. The normal oxide films do not interfere with these operations to the point where a determinable savings can be made by their removal.

Conversion Coatings

Regarding painting, where mild corrosive conditions are concerned, both aluminum and steel can be painted directly after the removal of the first two classes of contaminants. Where rough usage or strongly corrosive conditions must be resisted, the conversion of the surface of the metal to a thin phosphate film or layer of chromates greatly increases the adherence of the organic coating and also inhibits corrosion when the paint film is broken or penetrated. As stated previously, the oxides must be removed for effective spotwelding and electroplating.

Where the aluminum cleaning problem becomes individualistic is in the chemistry of aluminum itself. Although aluminum has exceptional corrosion resistance under normal atmospheric conditions, it is one of the most active of common metals—second in activity to magnesium among the commonly fabricated metals. It is this activity that causes an unoxidized aluminum surface to react with oxygen to form a thin, continuous, protective layer of aluminum oxide. It is this oxide film which gives to aluminum its corrosion resistance.

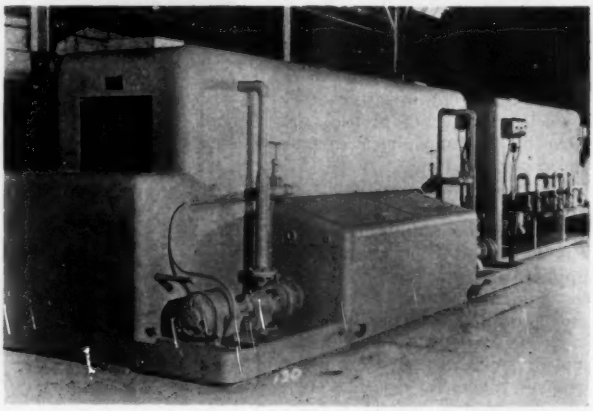
In developing a medium for the removal of the first two classes or groups of contaminants, it is necessary that the oxide film not be destroyed. Either the alkalinity or acidity of the cleaner must be such that no reaction occurs between the solution and the aluminum oxides, or the cleaner must contain inhibitors which will prevent a reaction between the solution and the aluminum oxide. Solvents and emulsion solvents are sufficiently neutral to be unreactive with aluminum oxide. Alkaline cleaners must be inhibited because those materials which have the necessary detergent characteristics attack or corrode aluminum alloys. Reaction products or break-down products of the cleaning solution or soil must be unreactive with the aluminum oxide.

Prior to anodizing and dyeing, electropolishing, phosphatizing and painting the so-called bulk contamination of the first two types must be removed. The most widely used and economical media for the removal of soil from aluminum and its alloys are the inhibited alkaline cleaners which remove the contaminants without attacking the oxide protective film or etching the aluminum.

These cleaners are mixtures of various alkaline inorganic materials such as soda ash, silicates and phosphates. Fluorides, chromates, silicates, and occasionally organics are among the materials which are incorporated as inhibitors. Varying quantities of organics such as wetting agents are also included.

Alkaline solutions for cleaning aluminum are utilized in two basic types of equipment—soak tanks and spray or mechanical

BELT CONVEYOR type cleaning machinery is useful for large quantities of small die castings or those not adapted for racking. Photograph courtesy Cincinnati Cleaning and Finishing Machinery Company.



washing machines. The equipment is generally constructed of welded mild steel. In soak tank cleaning, the work is placed on racks or in baskets or is hooked on wires—all constructed of aluminum unless a subsequent operation such as an acid dip necessitates the use of stainless steel—and immersed in the solution.

Wetting and Emulsifying

The detergency of the solution is dependent upon its ability to wet and emulsify the "dirt." Good wetting ability causes the cleaner to come into intimate contact with the contaminating film of oil or grease as soon as the aluminum is immersed. This intimate contact allows the alkaline solution to penetrate any discontinuities in the film. The interfacial tension existing tends to draw the oil into small balls or globules which are dispersed into and suspended in the cleaning solution. The ability to so disperse and suspend contamination is known as the emulsifying power of the solution. The resultant suspension of contamination is an emulsion and upon the stability of the emulsion is dependent to a great extent the rinsability of the cleaning solution.

Many emulsions break down when agitated, heated or when the suspending medium—in this case the cleaning solution—is diluted. Spray rinsing develops considerable agitation at the metal surface and any rinsing results in increasing dilution of the film of cleaner adhering to the metal surface. The degree to which the wetting and emulsifying powers and the stability of the emulsion are developed determine to a great extent the quality of the cleaner.

Another characteristic of alkaline cleaners which has great bearing on their rinsability is their water softening ability. The water hardness due to calcium and magnesium must be prevented from precipitating as grainy adherent carbonates or as gummy, sticky soaps (soaps

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used in cleaner formulation react with water hardness salts to form insoluble calcium and magnesium soaps).

This can be accomplished by incorporating sequestering agents in the cleaner. These materials are generally polyphosphates. They tie up the components of water hardness as soluble complex salts, thus preventing the formation of the "white films" which occur when the above-mentioned precipitates form and adhere so tenaciously to the work.

Sequestering agents also prevent the formation of scale on the walls of the tank and on heating coils (where the scale can so effectively prevent heat transfer that low solution temperatures make acceptable cleaning impossible).

Soak tanks are normally operated at 2-8 ounces per gallon and 150-180 F. Immersion intervals are dependent upon the type and degree of contamination, generally 5-10 minutes is sufficient. Higher temperature, agitation and higher concentration as a general rule increase the rate of cleaning, but the temperature must not be raised to a point where the inhibitor loses its effectiveness or where cleaner films dry too greatly during transfer to rinse tanks. The most effective temperature should be determined and maintained.

Some agitation is obtained by convection currents but it can be supplemented by a moving work rod, circulation of the solution with a pump or impellor or by bubbling compressed air from holes in pipes on the bottom of the tank. Agitation removes contamination from the immediate vicinity of the aluminum and constantly supplies fresh solution to the surface of the aluminum.

Agitation also causes soak tank cleaners to foam. The wetting agents and emulsifying agents reduce the surface tension to 25-35 dynes/sq.cm., whereas that of water is 72 dynes/sq.cm. Pure water will

(Continued on Page 59)

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HIGH-SPEED PAINT SPRAY LINE USES ELECTROSTATIC METHOD

1. RACK MADE FROM STEEL TUBING welded at the joints and loaded with die cast record changer bases is shown above ready for cleaning and chromate treatment in the dip tanks. Handling of the rack is done by electric trolley hoist.

2. RECORD CHANGER BASES are loaded on conveyor carriers at the station shown at the left and are carried through two spray booths, the second (seen in background) being provided with electrostatic equipment.

3. INDIVIDUAL ROTATING CARRIERS hanging from a chain conveyor carry die cast bases through an electrostatic spray booth. Usually, two guns apply synthetic lacquer automatically and one, outside the booth, applies a lacquer thinner to yield a hammer-type effect.

EXACTING finishing operations are demanded by the many large companies that purchase record changers from the VM Corporation, Benton Harbor, Mich. Specifications for such finishes must be met to pass inspection both in the VM plant and by its customers in their plants. At the same time, economy in finishing as well as in other production operations must be attained to fulfill contracts and still show a reasonable margin of profit.

For these reasons, VM production engineers have made a close study of finishing and follow highly efficient methods. Operations here described relate only to the large die cast zinc alloy base on which other components of the assembly are mounted. *Only the top of the base is exposed in service but purchasers require that the die casting be given a corrosion inhibiting pre-treatment all over and that this treatment shall not change the color of the castings where no finish is applied on the under side.* In addition, the treatment must insure excellent adherence of the coating applied later to the exposed top and outer edges of the base.

As the usual chromate and phosphate treatments alter the natural zinc color, VM employs a dip process of its own that accomplishes the desired results otherwise and still leaves the

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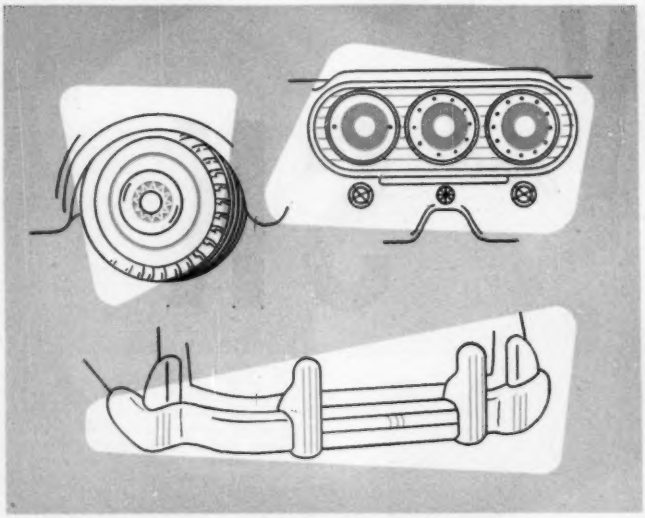
color unchanged. This treatment is applied with the castings held on special racks made from steel tubing, one being shown in Figure 1. Loaded racks are lifted by an electric trolley hoist by which they are also shifted from tank to tank in the row, Figure 1.

The initial dip is for two minutes in a solution containing 6 oz. per gal. of WLG Wyandotte cleaner heated to 180F. This is followed by a dip rinse in circulating tap water and then by a three-minute dip in a solution containing 8 oz. per gal. of chromic acid and 2 oz. per gal. of sodium chloride, the bath being at room temperature. Etching that takes place in this solution helps to hold the lacquer as does also the coating that results from the chemical reaction in the bath.

Two rinses complete the pretreatment, the first being in cold tap water and the second in water at 160F. Heat applied by this bath helps to make the castings dry rapidly. No spotting, streaking or discoloration result and castings are dry by the time they reach the spray booth on another floor.

Top contours of the die cast bases vary to some extent, some having well rounded corners and others corners that are nearly square. As those with rounded corners predominate, the electrostatic spray booth employed is designed primarily for this type but others are also put through the same setup. As the square-cornered type is not fully covered in the electrostatic spray, however, this type is first put through a small hand spray booth to coat those portions of the top and edges that would not be properly coated otherwise.

All spraying is done with parts hanging from a chain conveyor, loaded at the station, shown at the left in Figure 2.



"WE'VE FOUND A FINISH THAT REALLY STICKS TO CHROME-PLATED DIE CASTINGS"

say 3 of the biggest automobile manufacturers*

Field tests prove that COPRENE is outstanding

Getting a decorative finish to stick to a chrome-plated surface is a really tough job — but M & W COPRENE coatings have demonstrated beyond doubt that they can take the assignment in their stride.

One of the largest producers of die castings*, after extensive field tests, now uses COPRENE on the chrome plated parts he supplies to a major automotive company — one of the three who have found COPRENE outstanding in adhesion.

These modified rubber base synthetics also display exceptional resistance to most chemicals and outdoor weathering — retain their flexibility on aging.

*Names on request

Get the full story on this outstanding finish—write for Technical Data Bulletin #111 and Standard and Metalustre Color Cards . . . or let our M & W technical consultant discuss your requirements privately with you.

75th ANNIVERSARY 1879

MAAS & WALDSTEIN COMPANY

PACIFIC COAST DIVISION: SMITH-DAVIS CO., 10751 VENICE BOULEVARD, LOS ANGELES 34, CAL.

MANUFACTURERS OF INDUSTRIAL FINISHES

4. BAKING CYCLE takes nine minutes with infra-red radiation, with maximum temperature of 375 F for two minutes. Shown here are the trays on a conveyor as they are carried into the baking oven.

In the electrostatic booth, background of Figure 3 where most of the finish is applied, the wires creating the field are so arranged, of course, that spray is drawn to the desired areas and almost no overspray results. This avoids much waste of the synthetic enamel (such as would

(Continued on Page 52)

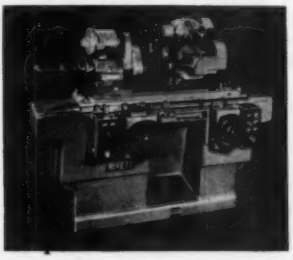
NEW PRODUCTS

For additional information on the products appearing on this and the following pages, mark the key number of the item on the card bound into this issue. Drop the card in the mail—no postage is required.

GRINDER WITH INTERNAL & EXTERNAL SPINDLES

Model 1024 grinder

Rivett Lathe & Grinder, Inc., Brighton, Mass.



SPECIAL FEATURES: Wheelhead mounts both internal and external spindles, eliminating dual set-ups, as operator can present either spindle to the same work. Designed to perform all types of internal and external grinding.

SPECIFICATIONS: Internal spindle speeds from 6000 to 35000 rpm. All spindles flange mounted and sealed. Micrometer table stop and fine feed for shoulder and blind hole grinding. Sine bar for setting workhead on swivel for tapering work. Double swivels on cross slide for two angle internal and external grinding. Feed controls at operator's right hand, table traverse controls at operator's left hand.

For additional information circle No. 1 on the Reader Service card.

FINISH FOR THIN ZINC COATINGS

Iridite treatment.

Allied Research Products, Inc., Baltimore.

SPECIAL FEATURES: Produces protective chromate film on surface of treated part. Film can be produced on zinc plate as thin as 0.0001. Can be used in automatic plating machinery. No bleaching operation required.

SPECIFICATIONS: Color is bluish bright or yellow iridescent, depending upon operating conditions. Corrosion resistance increases with intensity of iridescence. Immersion time from 20 seconds to more than a minute. Shipped to users in a combination of liquid and powder.

For additional information circle No. 2 on the Reader Service card.

FLUID-ABRASIVE MACHINE FOR FINISHING METAL SURFACES

Fluid-Abrasive Surface Finishing Machine

Jewett Mfg. Co., Cleveland.

SPECIAL FEATURES: For cleaning and preparing zinc or aluminum die castings for painting and plating. Has no moving parts in contact with abrasive. Does not use a pump. Rust-proof tank eliminates splashing.

SPECIFICATIONS: Welded sheet-steel cabinet has hopper containing 50 lbs. abrasive and 8 gals. water. Mushroom type agitator keeps abrasive in suspension. Syphon jet gun sucks up slurry and compressed air propels it against the work with impact of 85 oz. Operator works from outside through arm holes and inspection window. Fluorescent lighting. Filtered exhaust system. Knee-operated valve washes light, window and filter. Foot throttle regulates air. Available in 7 sizes and with special equipment for automatic applications.

For additional information circle No. 3 on the Reader Service card.

HARD CHROME PLATING PROCESS

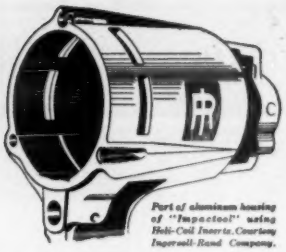
Model A-20 Chromaster and Chromasol.

Industrial Chrome Div., Ward Leonard Electric Co., Mt. Vernon, N. Y.

SPECIAL FEATURES: Process increases wear life of cutting tools and wear parts 3 to 10 times. Unit is compact and completely portable. The solution, Chromasol, is shipped in liquid, concentrated form. Said to reduce friction up to 20 per cent.

SPECIFICATIONS: Process operates at room temperature. Will plate metal surfaces up to 10 square inches with deposition controlled to tolerance of less than 0.0001. Average process time 1.5 minutes. Rate of deposition is 0.002. Recommended current density 2 amps per square inch. Powered by a dry disc, power pack, selenium rectifier. A-20 comes complete with plating bath tank, heavy duty rheostat, timer, ammeter and reversing switch for stripping action.

For additional information circle No. 4 on the Reader Service card.



Part of aluminum housing of "Impactool" using Heli-Coil Inserts. Courtesy Ingersoll-Rand Company.

HOW TO MAKE BETTER... CHEAPER DIE CASTINGS

It is easy to simplify design and effect impressive economies in all die castings by the use of Heli-Coil® Screw-Thread Inserts.

These precision-formed threads of stainless steel or phosphor bronze wire offer these major advantages:

1. They add great strength to the threads in the parent metal . . . permitting smaller thread holes and reduction in boss size.
2. They provide permanent, positive thread protection . . . prevent damage from high torque and vibration.
3. They eliminate corrosion, galling and seizure.

Simple addition of these 3 advantages equals . . . better end product . . . less field service . . . complete customer satisfaction.

Heli-Coil Inserts fit all National Coarse and Fine Thread Series . . . also spark plug and pipe thread sizes. They meet all specifications for military, industrial, automotive and aviation use.

Mail coupon below for prompt and complete information.

HELI-COIL CORPORATION

Heli-Coil Corporation

47-99 Thirty-Fifth Street, Long Island City 1, N. Y.

Please send me new Bulletin No. 650 on Design, Specification and Installation Data.

NAME ..... TITLE .....

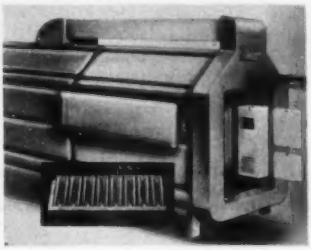
FIRM .....

STREET .....

CITY ..... ZONE ..... STATE .....

ELECTRIC PROCESSING OVEN BUILT OF STANDARD PANELS

Advance Heater Panels
Advance Heating Division, Jensen Specialties, Inc., Detroit.



SPECIAL FEATURES: Used for pre-heating, drying, baking or curing. Construction consists of prefabricated steel units with electric panels to provide heat. Construction can be changed by adding more panels. Uses standard electric heating rods.

SPECIFICATIONS: From 4 to 40 kilowatts in heat from each panel. Panels are 26" by 48" and are accessible from outside the oven. Produce temperatures up to 650 F. Energy transfer rates up to 11,000 BTU per hour per square foot. Automatic temperature control. Made for use with automatic handling equipment.

For additional information circle No. 5 on the Reader Service card.

AIR AND HYDRAULIC VALVES FOR FIVE CYCLES

Hand, foot, and finger-operated valves.
Ledeen Mfg. Co., Los Angeles.

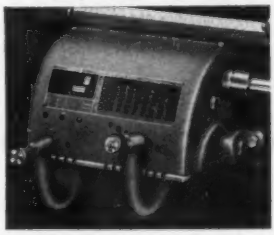
SPECIAL FEATURES: Used for controlling the flow of air, oil or water. Made in 14 models for five different cycles in six sizes. Made for hand, foot, and finger or solenoid operation.

SPECIFICATIONS: Hand-operated valves turn 45 degrees, foot-operated valves 15 degrees, each way from neutral. Solenoid valves require only momentary energizing, and are actuated by two small poppets which are depressed about ⅛".

For additional information circle No. 6 on the Reader Service card.

QUICK-CHANGE GEAR BOX

Quick change gear box for South Bend Lathes.
South Bend Lathe Works, South Bend, Ind.



SPECIAL FEATURES: Made for South Bend 14½" and 16" swing lathes. Feed can be changed from coarse to fine by shifting a single lever. There are no sliding clutches or sliding primary end gears to change. Saves time and requires less power.

SPECIFICATIONS: Two tumbler levers give 48 screw thread pitches, 48 longitudinal feeds and 48 cross feeds. Index chart is reference for placing levers in position. Provision is made for special gearing needed to cut metric screw threads, diametral pitch worm threads or other screw threads. Lubrication from single reservoir.

For additional information circle No. 7 on the Reader Service card.

New Improved Service Facilities For STEVENS CUSTOMERS

This modern, well-lighted workroom is Stevens' new experimental polishing and buffing laboratory . . . developed and expanded to serve the needs of metal finishers.

For years the Stevens organization has concentrated on bringing better polishing and buffing methods to users of Stevens compositions. To provide this service, Stevens has maintained facilities for finding quick, practical answers to customers' production problems. Our new installation—featuring all new machines and highly experienced technicians—working with our composition laboratory—enables us to extend this service far above and beyond previous efforts.

Let us help you find new polishing and buffing profits with Stevens methods and materials. Our staff can show you many ways to cut costs *and* improve your finished product—without obligation. Either call on your nearby Stevens representative or write direct to Frederic B. Stevens, Inc., Detroit 16, Michigan.

METAL FINISHING EQUIPMENT AND SUPPLIES SINCE 1883

FREDERIC B. **STEVENS** INCORPORATED

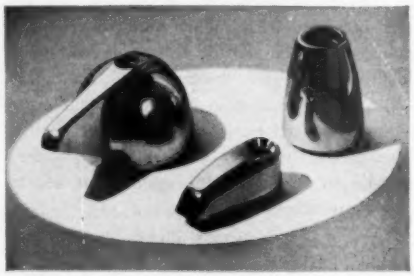
DETROIT 16, MICHIGAN

PREVENT Blistering, Streaking
on zinc-base die-castings

with DIVERSEY No. 505

Sensational NEW
ELECTRO-CLEANER AND SURFACE CONDITIONER!

Actual photograph of blistering on zinc die casting cleaned with conventional cleaner.



Actual photograph of finished zinc die castings cleaned in new Diversey No. 505.

Designed especially for reverse current electro-cleaning of zinc-base diecastings, *new* Diversey No. 505 completely, *safely* removes all unwanted deposits! In addition, Diversey No. 505 helps condition the surface of the zinc, providing better adhesion between the electro plate and the base metal!

This unique, double-action of Diversey No. 505 helps provide a uniformly clear, brilliantly lustrous finished surface . . . one free from blistering, peeling and streaking! Diversey No. 505 is economical, easy to use and available now! Investigate Diversey No. 505!

For complete information on Diversey No. 505

THE DIVERSEY CORPORATION
Metal Industry Department
1820 ROSCOE ST., CHICAGO 13, ILL.

THE DIVERSEY CORPORATION
METAL INDUSTRY DEPARTMENT
1820 Roscoe St., Chicago 13, Ill.
Gentlemen:
Please send me complete information on *new* Diversey No. 505.

Name_____
Title_____
Company_____
Address_____
City_____ State_____
DM-7

USEFUL LITERATURE

For additional information on the products appearing on this and the following pages, mark the key number of the item on the card bound into this issue. Drop the card in the mail—no postage is required.

25 VARIABLE SPEED LATHE:

The HVL lathe manufactured by Hardinge Brothers, Inc., Elmira, N. Y., is described in a company bulletin. This lathe has a variable speed drive for the headstock spindle and an independent variable feed drive for the carriage and cross slide.

26 VAPOR DEGREASING CATALOG:

A catalog of standard Circo degreasers is offered by the Circo Products Co., Cleveland. The company makes degreasers to handle all types of work.

27 ABRASIVE BELT LUBRICANT PREVENTS LOADING:

Descriptive literature on F-26, a lubricant designed to prevent abrasive belt loading and glazing, is available from the Formax Manufacturing Corp., Detroit. The product is said to increase belt life and to produce smoother finishes.

28 COPPER, BRASS AND BRONZE ANODES:

Anaconda anodes made of copper, brass or bronze and copper cathode-anodes are described in publication C-5, which may be obtained from the American Brass Co., Waterbury, Conn.

29 RAPID METHOD FOR COPPER AND IRON DETECTION:

"Direct Colorimetric Determination of Copper and Iron in Tin and Lead Base Alloys" is the title of a research paper offered by Silverstein and Pinsof, Inc., Chicago. The paper describes a rapid method of testing alloys for these two metals.

30 METAL FINISHING SERVICE:

The various metal finishing services available at the Pyrene Manufacturing Co., Newark, N. J. are described in a company bulletin. The company does job finishing of metals by a large number of processes.

31 DIPPING BASKETS:

A table for the selection of the proper dipping basket material for any given purpose is contained in Bulletin D-107, available from the Hanson-Van Winkle-Munning Co., Matawan, N. J.

32 MACHINING DIE CASTINGS:

The December, 1950 issue of Tool Tips, published by the Ex-Cell-O Corp., Detroit, shows applications of Ex-Cell-O machines in facing and boring die cast transmission parts automatically.

33 SOLVENT-EMULSION CLEANERS:

A series of emulsion cleaners designed to remove oil and water soluble soils from any metal or alloy is described in a folder offered by the Detrex Corp., Detroit. These cleaners are also said to be harmless to most paint finishes and do not attack the base metal.

34 METHODS OF BROACHING DIE CASTINGS:

Bulletin 10052, issued by the Oilgear Co., Milwaukee, gives information on the company's line of broaching machines and power presses. Attached to the bulletin is a reprint of an article on the use of broaching machines in finishing die castings.

35 VISE HAS SLIDING JAW:

A vise which can be can be put in "neutral" so that the jaw will slide in or out is illustrated in bulletin A-601, available from Dodge Manufacturing Corp., Mishawaka, Ind. The vise also features a "no-pinch" handle.

36 BULLETIN ON HEAT TREATING:

A new publication, designed to present developments in heat treating metallurgy and practice, has been initiated by Surface Combustion Corp., Toledo, Ohio. The bulletin will be published periodically and distributed to all persons concerned with heat treating operations.

37 DOUBLE UNIT PAINT HEATER:

The new Bede Double Unit Paint Heater is designed to provide a large volume of heated paint for installations using two or more spray guns. The heater is described in literature available from Bede Products, Inc., Cleveland.

38 SPRAY PAINTING EQUIPMENT AND METHODS:

Equipment and methods for all types of spray coating are shown in an illustrated 52-page catalog brought out by the Paasche Airbrush Co., Chicago. A separate 20-page price list gives prices on equipment shown in the catalog.

39 DIE SETS AND RELATED PARTS:

Descriptions, illustrations and prices of the Danly line of die sets, clamps, springs and shoulder bushings are contained in literature issued by the Danly Machine Specialities, Inc., Chicago, Illinois.

40 BOOKLET DESCRIBES ALUMINUM PRODUCTION:

Production of aluminum pig by the Hall electrolytic reduction process is described in a 12-page booklet recently published by the Reynolds Metals Co., Louisville, Ky.

41 OILS FOR HIGH TEMPERATURE USE:

The testing procedures used by E. F. Houghton & Co., Philadelphia, Pa., in setting up three series of Hi-Temp oils to meet temperature conditions up to 500 F are described in a folder issued by the company. The Hi-Temp oils are made in three compositions: straight mineral oils, oils of varying viscosities with added synthetic organic compound, and colloidal graphite in light volatile carrying oil.

42 ROTARY RETORT ATMOSPHERE FURNACES:

A new tool available to the production heat treater, the rotary retort controlled atmosphere furnace, is described in a bulletin issued by Surface Combustion Corp., Toledo, Ohio. These furnaces, said to permit fully automatic operation of the work feeding and processing system for gas case carburizing, homogeneous carburizing, dry cyaniding and clean hardening.

43 TWO BULLETINS ON GRINDING WHEELS:

Descriptions of tool and cutter grinding wheels are contained in Bulletin ESA-197, issued by the Simonds Abrasive Co., Philadelphia, Pa. Another bulletin, No. ESA-196, issued by the company gives grain and grade specifications for sharpening various types of saws used in industry.

44 TECHNICAL DATA ON RACK COATINGS:

Technical data and samples of Hysol 3000 coatings are available from the Houghton Laboratories, Inc., Olean, N. Y. Claimed for the coating are longer life because of resistance to corrosive chemicals and a smooth finished surface which holds solution drag-out losses to a minimum. In addition to supplying coatings, the company coats existing racks and builds and coats new racks to specifications.

45 THERMOCOUPLE AND PYROMETER ACCESSORIES:

Bulletin No. P1238, available from the Bristol Co., Waterbury, Conn., contains an illustrated catalog of pyrometer and thermocouple supply items manufactured by the company. In addition, technical information, installation sketches and other engineering data are contained in a "User's Manual" section. Calibration tables are included for commonly used base and rare metal thermocouples.

46 HOW TO CARE FOR BROACHES:

A three color wall chart for use in the plant to promote proper care of broaching tools is offered by the Colonial Broach Co., Detroit, to users of broaches. The chart lists ten basic "do's and don'ts" for increasing broach life in service.

47 VALVES FOR SMALL CYLINDERS:

The 880 series, a line of ¼" and ⅜" valves developed by the Ross Operating Valve Co., Detroit, for use in controlling small cylinders and for pilot operation of master valves, are described in the company's Bulletin No. 303. Installation data and engineering drawings are included.

All at one time...
it removes rust,
removes oil,
prepares the metal
for painting

This FREE Folder Tells About Oakite's Great New Pre-Paint Cleaner

OAKITE Compound No. 33 is a cleaning-phosphating material that simultaneously removes oil and rust and conditions the metal surface for painting.

It's a great soak cleaner for metal parts of moderate size; and great for hand-swabbing on large pieces like cabinets, desks, doors and truck cabs.

Oakite Compound No. 33 saves money, *frequently eliminates pickling operations on moderately rusty steel.*

FREE Write to Oakite Products, Inc., 34G Thames St., New York 6, N. Y., for your copy of Folder F7993 on *"Oakite Compound No. 33".*

Technical Service Representatives in Principal Cities of U. S. & Canada

OAKITE SPECIALIZED INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

in BURNISHING MATERIALS

it's the SHAPE that counts!

Parachute buckles and other fittings of the airman's life preserver must have smoothly burnished corners and surfaces.

When your product design requires a burnishing material which reaches into hard-to-clean corners . . . use Abbott Burnishing Diagonals. They're shaped to do the job right.

Abbott Burnishing Shapes . . . Ball, Ovalball, Cone, Diagonal, Pin . . . are scientifically designed to make effective contact on any size and shape of stamping or casting. Each is made from Abbott bearing ball steel, deep hardened and polished to a mirrorlike, glass hard finish. For *better* burnishing . . . use Abbott.

WRITE for Abbott Catalog-Manual showing burnishing mixtures and suggestions.

THE ABBOTT BALL COMPANY
1084 New Britain Ave.,
Hartford 10. Conn.

Barrel Finishing HEADQUARTERS

IF THERE EVER WAS A TIME FOR YOU TO INVESTIGATE THE REMARKABLE LABOR-SAVING OPPORTUNITIES OF

ALMCO Supersheen

. . . This is it

There is no lower-cost method of deburring and finishing metal parts. A single unit installation replaces from two to twelve men. We know of no installation that HAS NOT paid for itself in less than a year! In addition to reducing costs (UP TO 95%) almost any type of finish can be obtained from the fast removal of metal to the processing of close tolerance parts to almost any desired micro-inch reading. Investigate the Supersheen Process. Write today for full details.

ALMCO Supersheen

AMERICA'S LARGEST MANUFACTURER OF ADVANCED BARREL FINISHING EQUIPMENT—MATERIALS AND COMPOUNDS
ALBERT LEA, MINNESOTA

ALMCO SUPERSHEEN LEADS IN BARREL FINISHING ADVANCES

In the last three years startling advances in barrel finishing equipment and techniques have come from the Almco Research Program. Truly ADVANCED equipment has been developed — new super-efficient abrasive media and compounds have been discovered. ONLY ABOUT 30% OF INDUSTRY IS NOW BENEFITING FROM THE TREMENDOUS COST SAVINGS MADE POSSIBLE BY THESE NEW DEVELOPMENTS.

NEW EQUIPMENT

The present line of Almco Supersheen equipment is the most advanced and most complete on the market today! Barrel sizes range from 8" x 16" to 30" x 60". Many different types are now available for finishing parts heretofore finished only by hand. Handling equipment has been improved for speedier loading, unloading and separating.

NEW COMPOUNDS

The new Supersheen compounds are without parallel in the barrel finishing field. These new compounds have played an important part in attaining finer finishes, faster processing. Almco has chosen to develop its own barrel finishing compounds to insure "a better finish faster".

NEW TECHNIQUES

Almco engineers have developed new procedures that broadened the scope of barrel finishing to an almost unbelievable degree. The Almco Supersheen process is now being used by manufacturers in all fields for a multitude of finishing operations — deburring, grinding, cutting down, cleaning, forming uniform micro-exact radii, reducing surface porosity, finishing intricate parts, removing paint, coloring, burnishing, etc. No other techniques, producing comparable results, can operate with such low total paid labor time, moderate requirements of skill, and maintain practically any required production volume.

FREE SAMPLE PROCESSING

Almco maintains America's largest and most complete sample processing and research facilities. Sample processing is done on a "no charge" basis. We invite your samples and inquiry.

FREE

This inside story of Advanced Barrel Finishing. 20 pages of facts and figures. Write for Booklet No. D-2.

MAIL COUPON NOW!

ALMCO Supersheen, Albert Lea, Minn.

☐ Also send copy newest catalog.

NAME _____

ADDRESS _____

CITY _____ STATE _____

The Only AIR CYLINDERS With All Controls Built In

HERE are Air Cylinders so different in design that they have become known as the Bellows Air Motors. They are not rotary motors but double-acting, reciprocating, cylinder-type power units. Four-way directional valves and separate speed control valves for advance and retract strokes are built in. Only one air connection is needed, which can be flexible hose.

In manually controlled models (BM Series) the directional valve is operated by a lever adjustable to work from practically any angle in any plane. It may be operated by hand, linked to a foot pedal, or mechanically synchronized to a moving machine element.

In electrically controlled models (BEM Series) the Air Motor is equipped with the built-in Bellows Electroaire Valve, actuated by low voltage solenoids. The Electroaire Valve will operate at high speeds all day without discernible hum, pounding or overheating. In fact, the solenoids are guaranteed against burnout.

Bellows Air Motors are made in bores of 1¼", 1¾", 2½", 3⅜" and 4½", in any stroke length.

Write for New Bulletin — *Complete descriptions of Bellows Air Motors and other Bellows "Controlled-Air-Power" Devices: technical data, wiring diagrams, dimensions, application detail, etc. Ask for Bulletin CL-30. Address: The Bellows Co., Dept. DC 251, 222 West Market Street, Akron 9, Ohio.*

1207

HYDRAULIC CHECKING OF AIR POWER

The Bellows Hydro-Check removes the natural "bounce" and "springiness" from air—gives the smoothness of hydraulic operation to air-powered equipment—but keeps the speed, flexibility and economy of air-operation. The Hydro-Check is available for use with all Bellows "Controlled-Air-Power" Devices or may be installed to regulate and control the piston movement of standard Air Cylinders.

The Bellows Co.
AKRON 9, OHIO
FIELD ENGINEER OFFICES IN ALL PRINCIPAL CITIES

HIGH SPEED PAINT SPRAY

(Continued from Page 44)

result without the electrostatic equipment) and yields the uniform coating desired, these being the main advantages of this type of spraying, except that as a rule, the spraying is automatic and is done by two guns whose position is fixed. Occasionally, a sprayman is needed at the electrostatic booth, as Figure 3 indicates.

Eight bases a minute pass this booth and, when they issue from it, the coating is complete. To provide the hammered effect, however, the parts, after leaving the booth, pass another automatic gun (center foreground, Figure 3) that applies a light spatter of lacquer thinner.

During all the spray work, the supporting trays rotate about the support, this motion being imparted by a roller skate wheel that is arranged on the shank of each conveyor hook. The wheel bears on a track offset enough to cause the wheel rim to be pressed and to roll thereon and thus cause rotation of the supporting tray and of the work it carries.

Shortly after thinner is applied, the conveyor carries the work into and through a drying oven in which it remains nine minutes, passing continuously under the rays from infra-red lamps, Figure 4. During this bake, the work attains a peak temperature of 375F. which is held for two minutes. Shortly after leaving the oven, the conveyor passes an unloading point, near the assembly line and the bases, having cooled considerably, are removed by hand.

Although the processing described is simple and provides an enduring coat of excellent appearance, economy is high and the finishing is rapid. Total time in processing does not exceed 20 minutes from the start of the pretreatment to the end of baking and unloading, although the elapsed time may be longer because the parts may stand for some time between the end of dipping until hung on the finishing conveyor.

INDUSTRY NEWS

NOYES APPOINTED BY DIVERSEY

W. E. Noyes, general sales manager of the Diversey Corp., Chicago, for the past four years, has been named vice president in charge of sales. Announcement of the promotion was made by board chairman H. W. Kochs.

W. E. Noyes

Mr. Noyes is a graduate of Purdue University. He joined Diversey in 1935 as a field service representative. He was made manager of the Cleveland division in 1939, advancing to assistant general sales manager and then to general sales manager in 1946.

F. W. KNOKE OF AMERICAN ZINC DIES; WITH COMPANY 30 YEARS

Frederick W. Knoke, assistant manager of sales for The American Zinc Sales Co., St. Louis, died December 25, 1950.

Mr. Knoke joined the company in 1920, and a few years later was made western district manager. In 1930 he was promoted to assistant manager of sales, a position that he held until his recent death.

Mr. Knoke is survived by his wife, Edith F. Knoke, a son, Dr. F. W. Knoke, Jr., and a daughter, Mrs. B. R. Cockrell, Jr.

CARPENTER STEEL NAMES VON RAAB TO HEAD WAREHOUSE DISTRIBUTION

Frederick W. von Raab has been appointed manager of warehouse distribution for The Carpenter Steel Company and will have his head-

Get RESULTS like this on Your DIE CASTING MACHINE!

with RING Automatic SHOT CONTROL UNIT

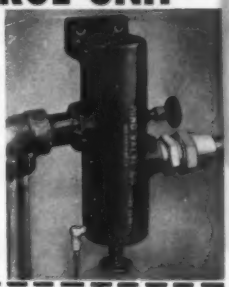
1 Casting as it came from machine.

Illustrations are from unretouched photos.

2 Same casting plated without trimming, polishing or buffing!

- Regulates shot from 1" to full stroke at variable speed
- Produces better surface and better structure
- Reduces rejects
- Gives longer life to "goose necks"
- Cycle time is not affected

MAIL COUPON FOR CIRCULAR!



RING VALVE CO., Inc.
CLAWSON • MICH.
Telephone LIncoln 2-3387

RING VALVE CO., Clawson, Mich.

Gentlemen:

Please send descriptive circular and data on your Ring Automatic Shot Control Unit.

Name .....

Title .....

Company .....

Street .....

City ..... Zone..... State.....

quarters at the company's main offices in Reading, Pennsylvania.

Mr. von Raab joined the organization in 1945 as manager of the export department and has served in that capacity to date. Prior to his service with The Carpenter Steel Company he was associated with the steel industry for many years.

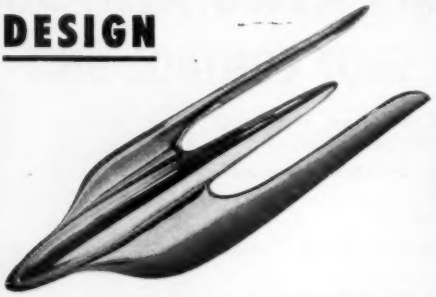
LUPOMATIC INDUSTRIES CHANGES NAME; BECOMES TUMB-L-MATIC, INC.

Lupomatic Industries, Inc., New York City, has changed its name to Tumb-L-Matic, Inc. According to Charles V. Yerger, president, the change was made in order to identify the company more closely with its products, which have carried Tumb-L-Matic as a trade name for several years. The company will continue to operate its New York facilities.

ELMER A. LORD PROMOTED

Cowles Chemical Co., Cleveland, recently announced the promotion of Elmer A. Lord to the position of sales promotion manager. Mr. Lord will be in charge of the company's advertising, sales promotion and public relations activities. Mr. Lord has been with the company since his graduation from Western Reserve University in 1947.

DESIGN



DIE CASTING by YODER

Depend on Yoder's experience and precision workmanship to safeguard the distinctive qualities of your artistic design. Yoder furnishes a complete die casting service for zinc or aluminum alloy castings from a fraction of an ounce up to 2 pounds.

Call, wire, or write today . . . quick action on inquiries!

Centrally located to industrial producers

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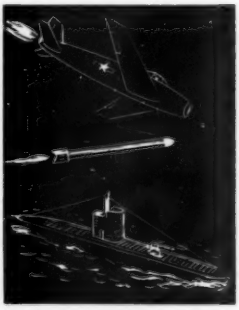
DIE CASTING, INC.
728 Kiser Street • Dayton 4, Ohio

"D-O"

MEANS *do*
at
LITEMETAL DICAST INC.

Raw materials are getting scarcer and scarcer. Light metal alloys are particularly short in supply. However, aluminum is more readily available than zinc and many items formerly die cast from zinc are now being produced in aluminum. This is proving satisfactory for several reasons, one of which is the availability of the material—another, the durability of the castings, and, thirdly, because of the reduced costs.



Production costs can still be lowered along with the weight of products through the use of die cast aluminum alloys. More freedom of design is allowed and greater scope is offered for the carrying out of the designers' ideas. In addition, these die castings save many man-hours of finishing time. Here may lie the solution to YOUR production problems.

LITEMETAL DICAST, INC. is an organization of specialists—men thoroughly experienced in the casting and machining of magnesium and aluminum alloys—the new metals of structural design.

Write today for literature and design information.

Quick action on inquiries.

LITEMETAL DICAST Inc.
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1925 WILDWOOD AVE. • JACKSON, MICHIGAN
PLANT AND EXECUTIVE OFFICES

METAL TRADES ASSOCIATION APPOINTS ENGINEERING COMMITTEE

Joseph L. Kopf, president of the National Metal Trades Association, Chicago, recently announced the appointment of members to the Association's Industrial Engineering Committee for 1951.

Named to the committee are: A. S. Davis of the Dexter Folder Co., Pearl River, N. Y., chairman; John J. Hall, Brown & Sharpe Mfg. Co., Providence, R. I.; W. L. Johnson, Bell & Howell Co., Chicago; Robert J. Jones, Crouse-Hinds Co., Syracuse, N. Y.; and W. E. Rutz, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

The committee will begin work immediately on studies to assist in establishing sound wage and salary programs to meet the needs of industry in the months ahead.

ASTE FORMS BOOK COMMITTEE

To help meet industry's demand for up-to-date technical literature, the American Society of Tool Engineers has formed a new ASTE Book Committee. This will be a permanent committee to replace the former ASTE Handbook Committee, which supervised preparation of the ASTE Handbook's first edition.

The new committee will not only supervise preparation of subsequent editions of the Handbook, but will determine the fields of industrial production in which specialized modern texts and manuals are most needed.

BORLET JOINS UNITED CHROMIUM

Chet Borlet recently joined the sales and service staff of United Chromium, Inc., New York City, according to an announcement by the company. After completing orientation courses at the company's organic coating and plating laboratories, Mr. Borlet will report to the Los Angeles office of the company.

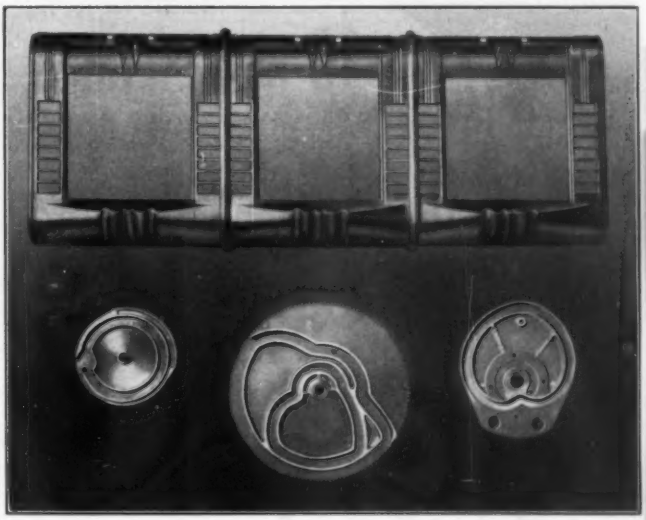
A graduate of Kent State University, Mr. Borlet has been connected with the plating sales department of the Harshaw Chemical Co. He has also been active for the past eight years in the Detroit branch of the American Electroplating Society.

PENNSALT PROMOTES TWO

The Pennsylvania Salt Mfg. Co., Philadelphia, has placed its six sales departments under the supervision of two assistant general sales managers, according to William P. Drake, vice president and general sales manager of the company.

Appointed to these two new positions are R. S. Roeller and A. G. Tunstall, Jr. Mr. Roeller will be in charge of sales of bulk or tonnage chemicals to manufacturing industry. Mr. Tunstall will have general supervision of all other company sales.

Production of a single pound of aluminum consumes four to six pounds of bauxite ore, as well as about 10 kilowatt-hours of electricity and ¾ pound of carbon electrode.



PRODUCTION SAMPLES ON THIS JOB WERE DELIVERED 7 WEEKS AFTER RECEIPT OF ORDER

Zinc die castings for a famous make record player illustrated above. The large casting at the top is approximately 12" by 30" weighing about ten pounds.

Cam tracks on lower castings were cast without draft and were held within .002. All parts were furnished ready for assembly.

Inquiries Invited

ACCURATE DIE CASTING COMPANY

3089 E. 80TH ST. CLEVELAND 4, OHIO

ZINC BEARING

(Continued from Page 51)

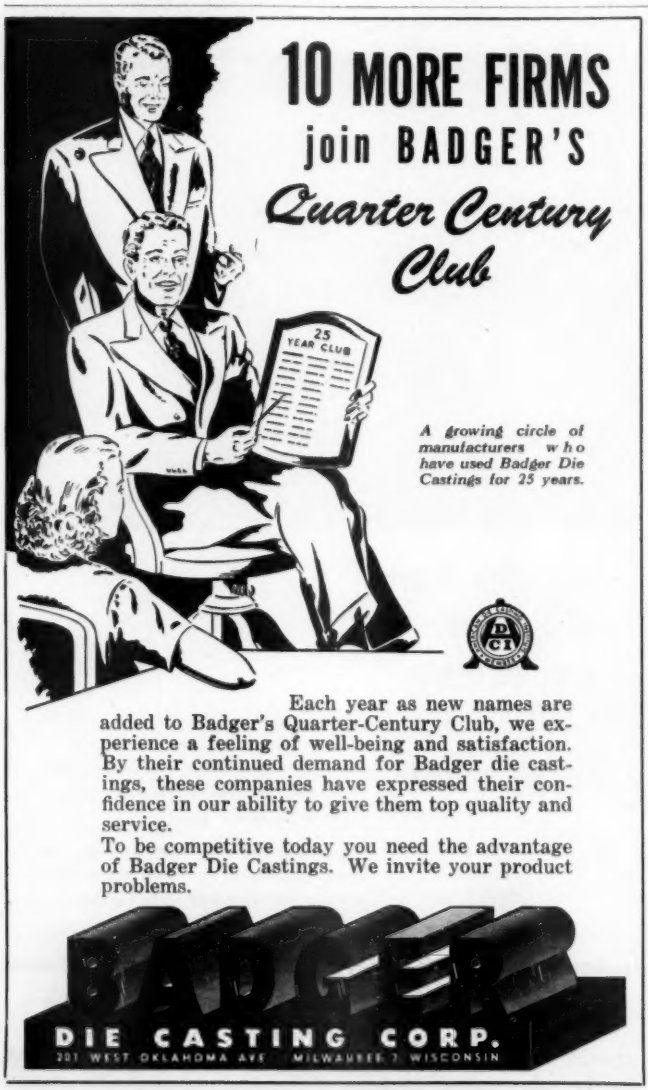
On the outside of the drum is wound a length of steel suspension tape which emerges from the face of the balance and is attached to one side of the sash.

Finally, a tapped, cored hole in the center of the flange serves for attachment of the pressed steel cover, resulting in an all-enclosed design. Incidentally, a recess on the underside of the flange accommodates the countersink in the pressed steel frame.

Simple Part Does Big Job

Because zinc on steel provides a good bearing surface, the result of using a die cast axle has been a *quietly* efficient spring sash balance. Because of this feature, this design is, in fact, the de luxe model in the line of Caldwell Manufacturing Company products.

It should be noted that the die cast axle requires no finishing or machining other than tapping the cored hole in the center of the flange. All the desired features relating to simplicity of assembly and efficiency in operation are traceable to the die cast axle.



Each year as new names are added to Badger's Quarter-Century Club, we experience a feeling of well-being and satisfaction. By their continued demand for Badger die castings, these companies have expressed their confidence in our ability to give them top quality and service.

To be competitive today you need the advantage of Badger Die Castings. We invite your product problems.

DIE CASTING CORP.

201 WEST OKLAHOMA AVE. MILWAUKEE 7, WISCONSIN

WOLFE GETS ASME POST

At a recent meeting in New York City, Bernard J. Wolfe, design engineer of the rectigraph division, Haloid Co., was appointed chairman of the Executive Committee, Machine Design Division, by the American Society of Mechanical Engineers.

APPOINTED SALES ENGINEER BY SURFACE COMBUSTION

Charles E. Newman has been appointed sales engineer for the Chicago territory by Surface Combustion Corp., Toledo, Ohio. In this new capacity, Mr. Newman, who attended Toledo University and joined Surface Combustion in 1936, will handle all lines of the company's standard industrial heating equipment.

RESEARCH FELLOWSHIPS OFFERED

Armour Research Foundation of the Illinois Institute of Technology, Chicago, is offering a number of research fellowships to begin in September, 1951. Awards are restricted to U. S. citizens under 28 who have a bachelor of science degree. Information and application forms may be obtained from the Office of Admissions of the Institute's Graduate School.

R. F. HART PROMOTED BY STANDARD VARNISH

M. H. Corbin, president of Standard Varnish Works, New York, recently announced the appointment of Raymond F. Hart to the position of assistant to the president.

In his new position, Mr. Hart's activities will be concerned with both the New York and the Chicago operations of the company.

OPPORTUNITIES

AIR FLASKS AVAILABLE

5000 lb. test; 17" diameter, 63" long; 6 cu. ft. internal capacity. For further information write:

THE BURDETT OXYGEN CO.
3300 Lakeside Avenue
Cleveland 14, Ohio
Attn: J. F. Wagner

POSITION WANTED

Die cast foreman, experienced. Write Box No. 2151, Die Castings Magazine.

Wanted Zinc die casting machine, equivalent to Cleveland Automatic Machine, Model No. 400. Write Box No. 2251, Die Castings Magazine.

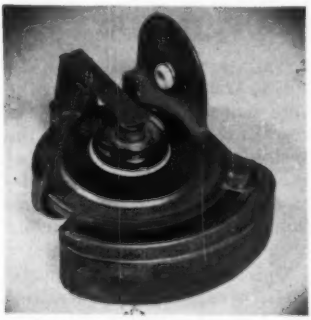
TEXTILE MACHINES

(Continued from Page 54)

is used in comparatively larger quantities than the twin disc unit. Tooling amortization can therefore be spread out over a larger run and results in lower unit costs.

The warp compensator is made for both right and left hand installation and therefore requires two cavities in one die casting die. The right hand mounting is shown in Figure 5 together with a small die cast cam which is the only other die casting in this unit.

The small cam mates with another cam formed as an integral part of the undersurface of the



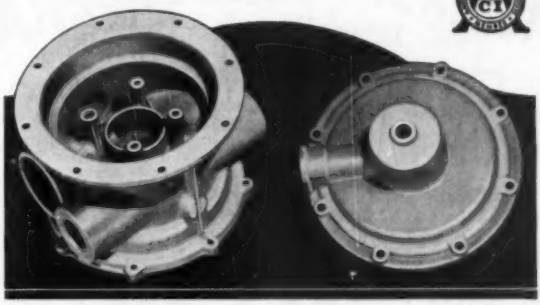
6. ALL ADJUSTING elements are mounted directly onto the die cast aluminum frame of this warp tension compensator.

large casting. The formation of these two mating cams as die castings represents a considerable saving over any other method of producing such mating cammed surfaces.

As received from the die caster, the compensator body is almost ready for assembly, and needs only the snagging of the flange, drilling of one deep, small diameter hole and the drilling and tapping of two others.

Incorporated into the mounting casting are the numerals and calibrations for the tension adjustment, a circular recess for the dial adjustment, and a flange and bosses for mounting the

"CLEVELAND"



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FOR A
VACUUM RELAY VALVE

"CLEVELAND" Service Includes

1. PROMPT ATTENTION TO ALL INQUIRIES
2. CLOSE COOPERATION WITH ENGINEERS
3. ACCURACY IN ESTIMATING REQUIREMENTS
4. EVERY EFFORT TO MEET DELIVERY REQUEST

Write "CLEVELAND"

QUOTATIONS ON BLUEPRINTS WILL BE PROMPT

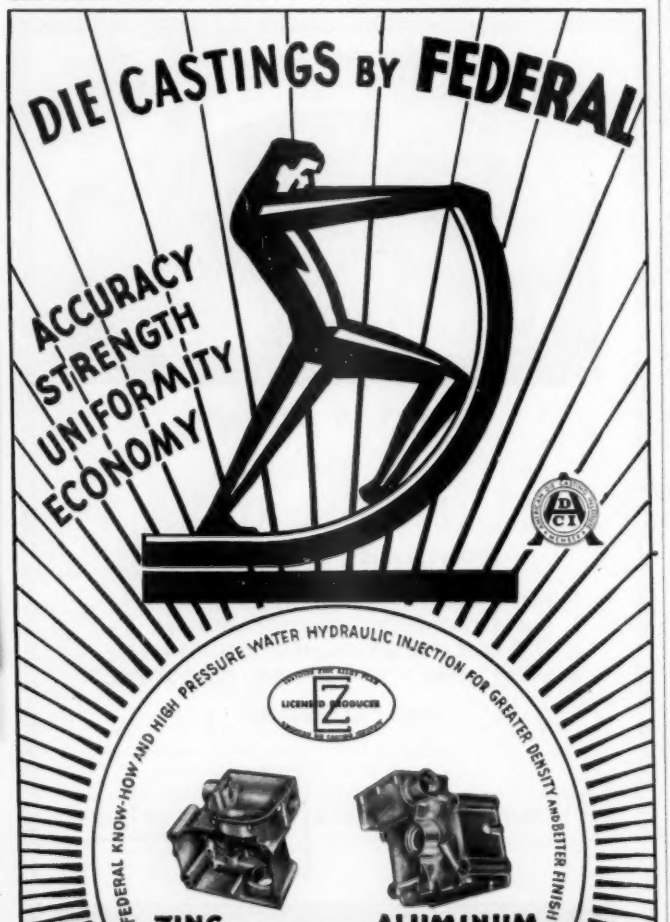
DIE CASTING DIVISION,
The Cleveland Hardware & Forging Co.
Established 1881
3256 E 79 ST CLEVELAND 4, OHIO

yarn guide and a flat tension spring.

The textile machinery industry has been increasingly aware of the suitability of die cast parts for their particular manufacturing needs, with the result that during the past few years, many zinc, aluminum and magnesium die castings have put in an appearance on knitting machines, knot tyers, stop motion devices, looms and other specialized equipment.

In most of these instances, the use of die cast parts has come as the result of redesigning a sand casting or other type of component, but the series of tension compensators designed by Walter Kidde & Co. were conceived originally as die castings.

For strength, smoothness of surface, accuracy of dimension and economy due to elimination of secondary operations, die cast parts have proved to be a wise choice in these tension compensators.



SIMPLE FITTINGS

(Continued from Page 19)

cast in grey iron. Although this is not dimensionally critical, there were several machining and finishing operations, including boring out the collar, facing the mounting surface, and drilling and tapping the mounting holes; all of these operations are now unnecessary except for tapping the mounting holes which are cored.

The upright posts, used three-to-a-unit on the cylindrical flatware dispensers, were machined from bar stock until the economy of die casting them was realized. The machining involved rounding off one end on an automatic screw machine, drilling and tapping a hole in the underside, and drilling and tapping a cross hole. In addition, the most expensive operation was the engraving of company identification and a series of six patent numbers. Now, the numerals and letters are formed in the die casting process, eliminating this costly engraving, and the only machining is to drill and tap a cross hole and to tap the mounting hole in the underside.

Typical Small Parts

The third die casting is a spring retainer in which the only machining operation is a recessing cut to anchor the spring. This prevents loss of the spring when the part is disassembled or adjusted. The retainer is formed with knurling around the edge.

On each of these three parts, used in considerable quantities by AMF Lowerator Division, cost reductions have been made possible by the use of a zinc die casting. These components represent a type of part which is to be found on virtually all types of machinery—small flanges, bushings, posts, retainers and other simple shapes—which are readily adaptable to the die casting process.

CLEANING ALUMINUM

(Continued from Page 40)

not foam but as its surface tension is lowered, the tendency for foaming increases. Soak tank cleaners will foam more than do any other alkaline cleaners.

Properly balanced alkaline cleaners are economical due both to their initial low cost and to their exceedingly long life. Proper maintenance of their initial concentration (a simple titration determines the solution's concentration) allows large quantities of contamination to be introduced without noticeable reducing the cleaner's detergent powers.

Spray washing is performed by moving the material to be cleaned through sprays of cleaner solution. The means of conveyance can be a monorail from which the work is suspended, a wire mesh belt upon which the work is placed, a helical fin on the inside of a revolving cylinder or any such device which

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ALUMINUM OR ZINC

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QUALITY PRODUCTS SINCE 1910

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THINK of S-G

WHATEVER YOUR CASTING PROBLEM may be—die cast—permanent mold or sand cast, specify S-G Aluminum Alloys. Every step in their production is checked constantly by skilled laboratory men using the most modern equipment available. Our facilities are available to help you solve your specific problems.

Trouble-free production of quality castings doesn't just happen. The skill and know-how of diecaster or foundry is of prime importance. But the most skilled of craftsmen must have the right raw material to work with.

You can rely on S-G Alloys—they meet your most rigid specifications.

SONKEN-GALAMBA *Corporation*

Riverview at 2nd Street · Kansas City 18, Kansas

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ZINC BASE
DIE CAST ALLOYS

You're sure of Quality and Service

Specify "Certified" for High Quality . . .
Laboratory Controlled Zinc Alloy.

Certified Alloys Co.
BEDFORD, OHIO

will move the work through the sprays in such a position that the sprayed cleaner can impinge upon every square unit of significant surface. The spray washing section is usually followed by one or more spray rinse sections and, optionally (dependent upon subsequent operations), a drying section. The sprays of the rinse sections consist of water, hot or cold, rather than cleaning solution.

Alkaline spray wash cleaners, like alkaline soak tank cleaners, must be inhibited against attack upon aluminum. In other factors, these two types of alkaline cleaners differ. Where soak operations are entirely dependent upon instantaneous wetting and complete emulsification, the rate of which physical-chemical reactions are affected by temperature and agitation, alkaline spray wash operations for their effectiveness depend upon agitation in the form of impingement and shearing forces resulting from the directing of sprays of cleaner upon the contaminated metal at line pressures of 5-50 psi. Finely divided solid contamination such as smut which is so adherent that soak tank cleaners are ineffective is often removed by the agitation developed in spray washing.

Foaming Must Be Controlled

Naturally, where such turbulence as results from the spray is encountered, foaming must be controlled or cleaning solution reservoirs would either overflow or have to be considerably oversize, an uneconomical condition in either case. The wetting and emulsifying agents used for soak tank cleaners would promote foaming due to their effectiveness in lowering surface tension. Low cleaner concentration — ½ to 2 ounces/gallon—are normally used for spray operations and this aids greatly in controlling the quantity of foam produced. Choice of wetting and emulsifying agents and close control of their concentrations in cleaner formulas guard against the foaming problem.

Of major importance to spray washing operations is water

softening. In this type of operation, not only do the precipitated carbonates and soaps of calcium and magnesium contaminate the die-castings, extrusions, stampings or other parts being cleaned and build up on heating coils as an insulating scale, but they also greatly increase the maintenance cost of other parts of the equipment. They "plug" the spray nozzles and screens.

With the large number of sprays incorporated in spray washers, the buildup of hardness salts and soaps in them can be a maintenance problem of major importance, and if the sprays are not kept clean, can quickly reduce the effectiveness of the operation to a point where clean work cannot be obtained. The proper positioning of the spray nozzles and keeping them clean are absolutely necessary to make them effective.

A quality spray wash cleaner will contain sequestering agents which hold the bulk of the water hardness salts in solution or, with those salts which are not rendered soluble, produce precipitates which are light and flocculent — harmless from the standpoint of scale buildup on equipment.

Rinsability is important for the same reasons as given for soak tank cleaning. Temperature again has the important effect of increasing the rate of reaction.

Spray washers are generally operated at ¼-2 oz./gal. and 140-180F. The time interval of contact ranges from 30 seconds to 3 minutes, depending upon how much cleaning is required, the variation allowable in the speed of the conveyor and the length of the cleaning stage. The line pressures developed in the spray headers range from 5 to 50 psi.

Alkaline Soak Tank

Generally, work to be spray washed is covered only with thin films of contaminants. Bulky, heavy contamination is removed or softened and partially removed in alkaline soak tank operations. It is not uncommon,

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You're sure of Quality and Service

Fully Equipped to Serve you Promptly with All Aluminum Die Cast Alloys.

ALUMINUM SMELTING & REFINING CO., INC.

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ALUMINUM LEAD AND ZINC
DIE CASTING BY FORT
ASSURES ACCURACY, QUALITY AND FAST DELIVERY
FORT has a complete engineering and designing department at your disposal with complete tool and die building facilities on the premises.
FORT has a large die casting department with new FORT-built die casting machines being added regularly.
FORT has designed and built a new machine for casting automobile grilles and other items of comparable size—actual die space is 40" x 60" x 36" thick.
FORT has the enlarged facilities of its Detroit plant combined with the new Marysville, Michigan plant to greatly increase the production of FORT quality die castings to meet the most exacting delivery requirements.
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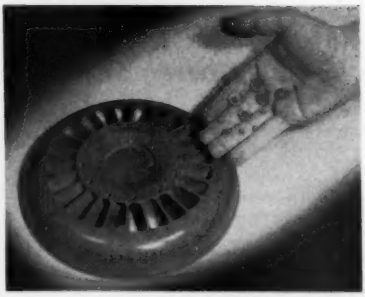
It's a Fact!

DIE CASTING IS A VERSATILE PROCESS



The Large pump head shown is a zinc alloy casting approximately 9" in diameter and weighing 4½ lbs. Smaller four tooth pinion held in hand (also zinc die cast alloy) is less than ¼" across and 2100 of them are required to make a pound. We will be pleased to work with you on your needs — just send prints or samples and specifications for estimate.

OLDEST DIE CASTERS IN UPPER MIDWEST
Licensed Producer
Certified Zinc Die Casting Plan

TWIN CITY DIE CASTINGS COMPANY
Talmage & 33rd Aves., S. E.
Minneapolis 14, Minnesota

and in many cases is good technique, to precede an alkaline spray washer with a soak tank with or without intermediate rinsing.

One other type of alkaline cleaning common to the preparation of most metals for electroplating is electrocleaning. To date, no effective electrocleaning technique has been developed for aluminum but, fortunately, the chemical characteristics peculiar to aluminum eliminate the necessity for one.

In addition to inhibited or non-etching alkaline cleaners there are alkaline etchants. These are not cleaners in the sense that cleaners are used to remove soils such as oils and greases. They are alkaline materials used for producing etched, matte, dull or satin surfaces as opposed to lustrous, bright surfaces.

The basic ingredient of these etchants or satinizing media is caustic soda. With the caustic soda may be incorporated wetting agents, emulsifying agents, and sequestering agents (for alumina as well as water hardness salts). No inhibitors, such as those incorporated into non-etching cleaners, are included.

The caustic soda attacks the aluminum, producing an etched surface. The degree of etch increases with increases in concentration of, temperature of, and exposure interval to, the etchant. The etchant is generally employed as a soak operation at concentration of 2-12 oz./gal. at temperatures of 70-180F for immersion intervals dependent upon the degree of etch desired. Choice of exact operating conditions is controlled by the quantity of work, equipment and space available and degree of etch desired.

(To be Concluded in March)

APPOINT NEW AGENCY

Maas & Waldstein Co., Newark, N. J., Chicago, and Los Angeles, manufacturers of industrial finishes, has appointed the Franklin Fader Co., Newark, to handle its advertising.

HANLEY ELECTED PRESIDENT

Election of Edward J. Hanley as president and Clark W. King as executive vice president of Allegheny Ludlum Steel Corp., Pittsburgh, was announced recently. Mr. Hanley, formerly executive vice president, succeeds E. B. Cleborne, who will continue to serve the company as a director and vice president.

PENNSALT OPENS NEW OFFICE

The opening of a new sales office in the Woolsey Building, 2168 Shattuck Ave., Berkeley, California, has been announced by the Pennsylvania Salt Mfg. Co., Philadelphia.

During peak periods of World War II, when the U. S. aluminum industry produced more than 2¼ billion pounds of aluminum in a year, more electricity was consumed for aluminum production in one day than would normally be used by a city of 60,000 homes in an entire year.

RACINE
ZINC
OR
ALUMINUM
die castings of highest quality produced on modern, fast equipment. Guaranteed satisfaction. Prompt service.
Inquiries Invited
Tell us your needs. Send blueprints or drawings for quotation. No obligation, of course.
RACINE DIE CASTING CO.
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SERVING THE CENTER of the Nation
★ Trimming
★ Machining
★ Die Making
★ Die Casting
★ Plating
★ Assembling
A quality zinc die casting service with complete facilities, located in the Midwest. Our fully-equipped plant is now serving some of the country's largest manufacturers, saving shipping costs, meeting rigid work specifications.
TRI-STATE DIE CASTING CO.
HENDERSON, KENTUCKY
Chicago: 176 W. Adams St. New York: 12 E. 41st St.
Detroit: 715 Donovan Bldg. (Geo. E. Oles)
Affiliate of Tri-State Plastic Molding Co.

For better and complete service... specify CENTRAL
• Complete engineering and design service.
• Wide range of quality aluminum or zinc alloys.
• Complete mold making facilities.
• Production facilities to meet your schedules.
You are assured high quality die castings from CENTRAL . . . a dependable source with complete facilities to meet your requirements.
Take advantage of our complete service and mail in your prints and specifications for prompt quotations.
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2933 WEST 47th STREET • CHICAGO 32, ILL.

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- You want quality and precision castings
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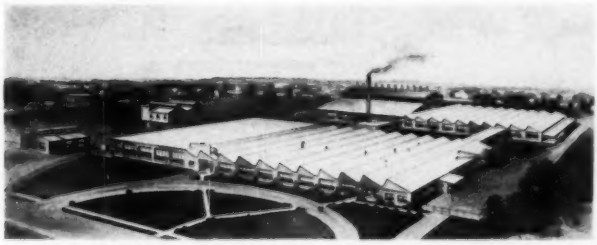
We Would Like You to Know These Men—

THIS is the third of a series introducing members of the HILFINGER organization. It is through the efforts of these individuals that our company has become one of the outstanding Producers and Finishers of Zinc Alloy Die Castings in the United States.

Shown at the right are key men in the business that makes and finishes the die castings that carry the name of HILFINGER.

INQUIRIES WILL RECEIVE PROMPT ATTENTION.



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CASE HISTORIES FROM MT. VERNON FILES

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Why not weigh the numerous advantages of die casting against your present manufacturing procedure—and consult with us? A switch to die casting may profit you all along the line.

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